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Serving the information needs of the genome research community: *A Project Status Report*



Compiled by
USDA, ARS, National Agricultural Library



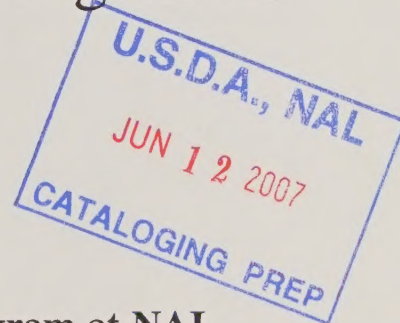
**United States
Department of
Agriculture**



National Agricultural Library

Serving the information needs of the genome
research community:

A Project Status Report:
FY'94 - FY'97



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USDA, ARS, National Agricultural Library
April 17, 1997

Introduction

Passage of the 1990 Farm Bill first established the USDA, Plant Genome Research Program¹. The Bill authorized the Secretary to fund research in four general areas: (1) the construction of plant genome maps; (2) the identification, characterization, transfer, and expression of genes of agricultural importance; (3) technology development in the research areas outlined above, including sequencing and data management; (4) research on microorganisms associated with plants, such as pathogens and symbionts.

The Secretary assigned authority for competitive research grants management to what is now the Cooperative State Research, Education, and Extension Service (CSREES) under the National Research Initiative Competitive Grants Program (NRICGP).

The Bill also mandated the coordination of Program operations among the related activities of the National Science Foundation, the National Institutes of Health, the Department of Energy, and the Department of Commerce. Such responsibilities required an overall leadership role for effective Program management. This role was given to the Agricultural Research Service (ARS); and within ARS the authority was conferred to the National Program Staff (NPS) and its Office of Plant Genome Research.

The first Director, Dr. Jerome Miksche, recognized and accepted the responsibility to manage data for the Program. Initially, 4 species were selected to establish user requirements; in terms of data content, search and retrieval needs, user interfaces, and so forth. Beyond establishing these basic requirements, each species group was asked to compile, analyze, evaluate and integrate as much relevant information as possible for its individual species. The small number of species included was intended to allow the database design team to have a sufficient range of data elements for user requirements; and yet a small enough test-bed so as not to overwhelm initial database design experiments.

The principal investigators selected for the initial design test were all recognized leaders in their fields and Lead Scientists within ARS. Database designs were evaluated for several years. At the conclusion of the evaluation stage, a federated-design structure was adopted. This structure allows independence between databases, provided that a common platform is used. The consensus platform was ACeDB, which offered many advantages to the plant genome community and was rapidly adopted by many species.

Additional species, selected by Dr. Miksche, were continuously added to the family of databases under the Plant Genome Database Program. Since Dr. Miksche's retirement in September 1995, Program guidance and species selection has been in the capable hands of Dr. Henry Shands, Associate Deputy Administrator for Genetic Resources.

NAL - ARS Plant Genome Partnership

In FY'90 the National Agricultural Library (NAL), as an independent agency, entered into a partnership with the Office of Plant Genome Research. This partnership was formalized in the document, "Plant Genome Activities at the National Agricultural Library: Roll-Out Plan FY 1991"², outlining NAL's role in the USDA Plant Genome Program:

The primary goal of the PGC [Plant Genome Center] will to [sic] be to make information relevant to plant (and animal) genome research readily available in useful formats. To this end, the Center will: strengthen NAL's collection; modify and strengthen the AGRICOLA database; plan, create, maintain and disseminate new databases containing plant (and animal) genome data; facilitate access to genome research data; and promote communication among researchers and other parties interested in genome research².

NAL embraced this opportunity to work closely with ARS on this high priority national initiative. The Roll-Out Plan was developed and implemented within FY'91. Program management within NAL was set at the highest practical working level. In FY'94 - FY'95 this position was held by Keith Russell, Associate Director for Public Services. Most recently this role has been filled by Gary McCone, Associate Director for Automation, Information Systems Division³.

This program was unique for NAL in the wide range of responsibilities assigned to the agency³. Leadership for each responsibility was appropriately delegated to the division recognized within NAL for excellence in that field.

The Technical Services Division was given principal responsibility to expand user access to published research findings. These findings are provided electronically to users via NAL's AGRICOLA database, which is built from the extensive collection at NAL. Recognizing this excellence, ARS designated AGRICOLA as the key database connecting published genetic literature with the data collected through the ARS research program.

The Information Systems Division was given principal responsibility to develop the information management system necessary to manage data generated by the USDA Plant Genome Research Program. This system must result in a stable database structure that meets user needs. NAL's leadership role, under the direction of the ARS Office of Plant Genome Research, was established in July 1991 at the NAL Technical Committee Meeting⁴. NAL's role is to manage the development of that federated database and to provide a central access point for all USDA research program data.

The Public Services Division was given the principal responsibility to interface with the user community, whose participation and involvement is at the core of any success achieved by the USDA Plant Genome Research Program. Interaction with users is the linchpin binding the elements of the NAL plant genome effort to the mission and goals of the USDA Plant Genome Research Program, under the direction of the ARS Office of Plant Genome Research.

NAL's Plant Genome Budget Overview

Table 1 provides a summary of the resource allocations between the Divisions of NAL for FY'94 - FY'97. Additional information is provided accounting for the NAL administered Specific Cooperative Agreements, many of which were used to add new species to the Database Program.

**Table 1. NAL's Plant Genome Budget
FY 1994-1997 Overview**

Division	FY '94	FY '95	FY '96	FY '97
Overhead	\$112,000.00	\$23,126.00	\$0.00	\$0.00
Total ISD	\$710,000.00	\$797,400.00	\$797,400.00	\$830,000.00
Total PSD	\$396,474.00	\$389,474.00	\$386,600.00	\$280,000.00
Total TSD	\$231,526.00	\$240,000.00	\$232,000.00	\$240,000.00
Total NAL Budget	\$1,450,000.00	\$1,450,000.00	\$1,416,000.00	\$1,350,000.00
ARS Coop Agmts	\$260,195.00	\$137,000.00	\$20,000.00	\$0.00
Total to NAL	\$1,710,195.00	\$1,587,000.00	\$1,436,000.00	\$1,350,000.00

Full Text References

- 1) 1990 Farm Bill - Section 1671. Plant Genome Mapping Program.
- 2) Plant Genome Activities at the National Agricultural Library: Roll-out Plan - FY 1991
- 3) National Agricultural Library Organizational Chart
- 4) NAL Technical Committee: July 10-11, 1991

- (2) providing United States leadership in biotechnology; and
- (3) providing crop varieties that may be cultivated profitably without negatively impacting the environment.

(b) **COMPETITIVE GRANTS.**—The Secretary may make competitive grants, for periods not to exceed five years, to State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, private organizations or corporations, and individuals for research projects in the research areas identified in subsection (c).

(c) **RESEARCH AREAS.**—Grants available under subsection (b) shall be awarded in the following research areas:

- (1) Construction of plant genome maps.
- (2) Identification, characterization, transfer, and expression of genes of agricultural importance.
- (3) Technology development in the areas of plant genome mapping, sequencing, gene transfer, and data management.
- (4) Research on microorganisms associated with plants, such as plant pathogens and plant symbionts.

(d) **PLAN FOR MAKING GRANTS.**—Not later than 90 days after the date of the enactment of this Act, the Secretary shall submit to the Congress a detailed plan for awarding grants under this section.

(e) **COORDINATION OF EFFORTS.**—The Secretary shall coordinate activities under this section with related activities sponsored by the National Science Foundation, the National Institutes of Health, the Department of Energy, and the Department of Commerce.

(f) **PROPRIETARY INTERESTS.**—The Secretary shall require (when the Secretary considers it to be appropriate) licensing and patent agreements, copyright fees, royalties, or other fee arrangements on the sales of products and new uses, applications, technologies, or processes developed through assistance provided under this section.

(g) **REPORTS.**—The Secretary shall submit to the Congress an annual report describing the operations of the grant program authorized by this section during the preceding fiscal year.

(h) **AUTHORIZATIONS OF APPROPRIATIONS.**—There are authorized to be appropriated such sums as may be necessary to carry out this section.

Copyright.

7 USC 5925.

SEC. 1672. SPECIALIZED RESEARCH PROGRAMS.

(a) **ANIMAL LEAN CONTENT RESEARCH.**—The Secretary of Agriculture is encouraged to fund research for the development of technology which will ascertain the lean content of animal carcasses to be used for human consumption.

(b) **ETHANOL RESEARCH.**—In order to further carry on and enhance needed ethanol research, the facility of the Agricultural Research Service located at Peoria, Illinois (authorized by section 202 of the Agricultural Adjustment Act of 1938 (7 U.S.C. 1292)), may enter into cooperative agreements, contracts, and the exchange of scientific information with the Department of Energy in the area of ethanol research. Such facility shall hereafter be referred to as the National Center for Agricultural Utilization Research, Agricultural Research Service, United States Department of Agriculture.

(c) **AFLATOXIN RESEARCH.**—The Secretary of Agriculture shall conduct a research program for the purpose of determining the presence of aflatoxin in the food and feed chains. The research required under this subsection shall include research in the following areas:

- (A) The examination of agricultural commodities, products, and feeds for the presence and quantity of aflatoxin.

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may obtain any
an order under
reement without

(1) the Federal Property and Administrative Services Act of 1949 (40 U.S.C. 471 et seq.); or

(2) any other law that prescribes procedures for the procurement of property or services by an executive agency.

(c) AUDITS OF RECORDS.—The financial records of the Graduate School relating to orders or agreements under subsection (a) shall be made available to the Comptroller General for purposes of conducting an audit.

(d) DEFINITIONS.—For purposes of this section:

(1) The term "Graduate School" means the Graduate School of the Department of Agriculture.

(2) The term "training" has the meaning given that term in section 4101(4) of title 5, United States Code.

SEC. 1670. LIVESTOCK PRODUCT SAFETY AND INSPECTION PROGRAM. 7 USC 5923.

(a) ESTABLISHMENT.—The Assistant Secretary for Science and Education, acting through the Cooperative State Research Service special grants program, may provide assistance to eligible entities to encourage and assist efforts made by research institutions to improve the efficiency and effectiveness of safety and inspection systems for livestock products.

(b) ELIGIBLE ENTITIES.—To be eligible to receive assistance under this section an entity shall be a land-grant college or university or any other college or university which demonstrates capability in the agriculture sciences, an individual research institution, or a consortium of such institutions.

(c) CONTRIBUTION BY ENTITY.—

(1) REQUIREMENT.—To be eligible to receive assistance under this section, an entity shall agree that such entity will, with respect to the costs to be incurred by the entity in conducting the research for which the assistance is provided, make available (directly or through donations) non-Federal contributions toward such costs in an amount equal to 50 percent of such costs.

(2) NON-FEDERAL CONTRIBUTIONS.—Non-Federal contributions required under paragraph (1) may be in cash or in kind, fairly evaluated, including plant, equipment, or services. Amounts provided by the Federal Government, or services assisted or subsidized to any significant extent by the Federal Government, may not be included in determining the amount of such non-Federal contributions.

(d) ADMINISTRATION.—In providing assistance under this section, the Assistant Secretary for Science and Education shall to the extent practicable ensure that the amount of such assistance is provided equally to eligible entities representing the beef, pork, lamb, poultry, and aquaculture industries.

(e) AUTHORIZATION OF APPROPRIATIONS.—There are authorized to be appropriated to carry out this section, such sums as necessary for each of the fiscal years 1991 through 1995.

SEC. 1671. PLANT GENOME MAPPING PROGRAM.

7 USC 5924.

(a) PROGRAM REQUIRED.—The Secretary of Agriculture (hereinafter in this section referred to as the "Secretary") shall conduct a research program for the purpose of—

(1) supporting basic and applied research and technology development in the area of plant genome structure and function;

DRAFT, Revised 10/15/90

Plant Genome Activities
at the National Agricultural Library

Roll-out Plan - FY 1991

- I. OBJECTIVES - To establish a Plant Genome Data and Information Center (PGC) at the National Agricultural Library during FY 1991. The primary goal of the PGC will be to make information relevant to plant (and animal) genome research readily available in useful formats. To this end, the Center will: strengthen NAL's collection; modify and strengthen the AGRICOLA database; plan, create, maintain and disseminate new databases containing plant (and animal) genome data; facilitate access to genome research data; and promote communication among researchers and other parties interested in genome research. (Note: Information centers at NAL typically include only Public Services Division Staff. The Plant Genome Data and Information Center includes staff from all divisions of the library. References to the PGC include the work of all staff in the Center, as outlined in VII.A.)
- II. SUBJECT/TOPICS - The scope of the Center includes all aspects of plant and animal genome mapping. It includes, but is not limited to, the following: nucleotide and protein sequencing; automated sequencing and large scale mapping efforts; physical and cytogenetic maps; plant breeding efforts based on, or making use of, mapping efforts; research procedures and equipment of potential applicability; scientific and bibliographic databases and software; developments in computational genetics; research that could lead to breakthroughs in collection, analysis, and management of genome data; trends in informatics; and progress of other related efforts/programs such as the Human Genome mapping program.
- III. CLIENTELE - The primary users are expected to be members of the biological research community from a variety of types of institutions such as private seed, biotechnology, and food processing companies; colleges and universities; extension programs; commodity group associations; stock centers and germplasm repositories; and international research centers. However, the services of the PGC will be available to anyone interested in plant or animal genomes - scientist, breeder, educator, student, legislator, information professional, administrator, or member of the general public.
- IV. ACCESS - Users may visit, call, write, FAX, or contact the Center by electronic means. Anticipated hours of operation

are Monday through Friday, 8:00 a.m. to 4:30 p.m., Eastern Time. After hours messages will be taken by an answering machine and answered the next business day.

V. SERVICES -

A. Creating and distributing scientific databases and collaborating with producers of existing databases.

1. NAL will be responsible for ensuring that genome mapping data, nucleotide and protein sequence data, and significant related information are available in new or existing machine-readable databases.
2. NAL will assess the genome-related data needs of ARS and the agricultural research community as soon as possible, and compare these needs with information available through existing databases and genome projects. NAL will recommend appropriate linkages to existing resources and identify additional needed data. Based on these evaluations, NAL will define file structures and data elements for a new database (or databases) created as part of the Plant Genome Research Program.
3. NAL is responsible for determining a production strategy that results in information being transferred from printed sources to the database format. This will include defining mechanisms of tagging journal articles processed by NAL for AGRICOLA, coordinating with other database centers, and entry of mapping, sequence, and other data elements.
4. NAL will develop a mechanism of distribution (e.g., NTIS) of the database(s) on a regular basis in electronic and other appropriate formats. This mechanism will be established during the first year of the project. Initially, NAL will work with ARS/SRL/ASRR to use their VAX computer system for online distribution of these databases. ASRR, which already has experience in this area, will provide:
 - a. Conferencing (Participate)
 - b. Genetic engineering software and databases (Wisconsin and GenBank systems)

- c. Use of the ASRR VAX 8250 or equivalent and support staff
- d. An appropriate DBMS for database activity
- e. BITNET &/or other networks for interface and access for communications between workers.

As needs evolve, or situations change, the host for this service may change.

- 5. NAL will collaborate with NLM, GenBank, PIR, and other database providers to ensure comprehensive coverage of plant (and animal) genome data.
- 6. NAL will explore and implement, as appropriate, mechanisms for reducing lag time between determination of sequences or other map data and appearance in the database(s). Ways to incorporate data before publications should be considered.

B. Developing the NAL collection and AGRICOLA.

- 1. The PGC will conduct evaluations of both NAL's collection and AGRICOLA's contents relative to available plant/animal genome literature. Based on these evaluations, coverage in both AGRICOLA and the collection will be improved to make them more comprehensive.
- 2. Indexing terms will be reviewed and modified, as needed, to improve access to documents in AGRICOLA.
- 3. Permission to copy published abstracts will be sought for copyrighted material. When permitted, abstracts will be added to genome-related records as they are created for AGRICOLA tapes. Feasibility, including cost analysis, of writing new abstracts when permission is denied will be investigated.

C. Providing access to genome-related information for researchers and others.

- 1. Information requests will be answered by PGC staff or referred to another appropriate organization or person. Center staff will be familiar with sequence databases and other scientific databases appropriate to genome research. They will be knowledgeable about the latest software

developments in the area of genome research and applications, including that used in laboratory data acquisition and analysis. Other major resources include access to bibliographic, numeric and full-text databases; access to NAL's collection and other collections via inter-library loan; and a referral network developed by the Center. In-depth reference and document delivery services will be available free of charge to participants in the USDA Plant Genome Research Program and to employees of USDA. (Note: under current NAL policy, user-fee charges would be applied to others; this is open to discussion.)

2. The PGC will develop publications to be disseminated in appropriate electronic/print formats. These will include, but will not be limited to, the following:
 - a. A bibliographic product identifying articles/documents within the scope of the Center (see II, above). Initially, this product will be a subset of AGRICOLA pertaining to plant (and animal) genome literature. Its nature, content, frequency of updating, and format will be based on user needs. Permission to include abstracts will be sought from publishers; however, if past experience is a good indicator, some will refuse. Original abstracts for these publications may be written, as resources allow. The distribution plan for this publication will be developed in collaboration with ARS.
 - b. Brochures and guides as needed to meet information needs of the scientific community and public.

D. Facilitating Research Communication.

1. The PGC will be responsible for the preparation of a newsletter about activities of the plant genome project and related projects. The Office of Plant Genome Research will be responsible for providing information about the program pertinent to the newsletter. Staff of the PGC will monitor related projects and provide information about the activities of the Center. The PGC may elect to contract out the writing of the newsletter, but is responsible for overseeing the project. Initial issues will be released on a quarterly basis, with

a bimonthly target by FY 1993. Development of this publication should take advantage of the experience of the Human Genome project newsletter.

2. NAL will create an electronic directory to plant genome resources that will include researchers, institutions, research capabilities and projects as well as other information sources. Initially PGC staff will perform complimentary searches on request. Other forms of access will be developed after a feasibility study has been conducted. An expert system with hypertext software features should be among the options considered. NAL may elect to develop software to provide access to this database.
3. The PGC will use ALF (Agricultural Library Forum), NAL's electronic bulletin board system, and other appropriate vehicles to facilitate communication among researchers in the program and others.
4. Appropriate PGC staff (or other NAL staff) will participate regularly in both government and scientific meetings in the broad area of genome research/applications/informatics both in the United States and abroad.

VI. COORDINATION/COLLABORATION - The Coordinator and Database Manager of the PGC will work closely with the Office of Plant Genome Research to inform it of NAL's efforts and to ensure that these efforts are effectively integrated into the overall program. A close working relationship will be necessary for success of such efforts as determining computer system requirements and developing distribution plans for databases and bibliographic products of the Center. With the possible exception of the project outlined in V.D.3, NAL does not anticipate developing software to provide access to databases produced through this program. NAL would initiate such ventures only in collaboration with the Office of Plant Genome Research.

NAL will maintain contact with scientists who will act in an advisory capacity to the Data and Information Center. This may be accomplished through the existing Plant Genome Database Subcommittee of the Science and Technology Coordinating Committee, USDA Plant Genome Research Program, or another expert advisory group designated by NAL.

Coordination of the work of NAL with GenBank, NLM, JITF, and other groups active in the production of genome-related databases will be a prime objective of the Center.

VII. ADMINISTRATION - The PGC will be administratively housed in the Reference and User Services Branch of NAL. The PGC Coordinator will report to the Head of the Reference and User Services Branch, with the database functions performed in the Information Systems Division and technical processing of documents (acquisitions, indexing, and cataloging) in the Technical Services Division. The Data and Information Center will be funded as part of the ARS Plant Genome Research Program through the Office of Plant Genome Research.

A. Staffing - Staff levels described below will be achieved as rapidly as hiring can proceed.

1. Public Services Division

- a. Coordinator (1) - Management of the Center, functions, interaction with the Office of Plant Genome Research and coordination of NAL efforts from all parts of the library (Public Services, Technical Services, and Information Systems) and with other genome efforts and database producers.
- b. Technical Information Specialists/Librarians (2) - reference, referral, publication development, collection development.
- c. Secretary (1) - typing, office management.
- d. Student Aide (2) - photocopying, general office help.

2. Information Systems Division

- a. Database manager (1) - Responsible for the technical aspects of database design and construction; coordinator for development and oversight of NAL produced database(s), development of new technologies. The Database Manager will work closely with the Coordinator and with the staff of the Office of Plant Genome Research.
- b. Database Specialists (2) - database development, implementation, and maintenance; assistance in using genome-related databases produced by NAL and others, including support in using a variety of software products to access these.

- c. ISD support personnel (0.5) - general systems support for Center, including arrangement of contracts for database searching, maintenance of hardware and related contracts, support for microcomputers, production of Quick Bibliographies, etc.

3. Technical Services Division

- a. Indexers (2.5) - located in Indexing Branch, NAL. To index genome publications for the AGRICOLA database, assign special tags/fields that can be determined at the time of entry to AGRICOLA, arrange for permission to copy abstracts and, as resources allow, to write original abstracts when permission is denied.
- b. Acquisitions/Cataloger (1) - to acquire and catalog new publications related to genome studies.
- c. Library Technicians (2) - Provide assistance with technical processes of acquiring, indexing and cataloging documents.

4. Other

- a. Visiting Scholar (1-2) - Bench scientist and/or computer/informatics specialist to advise and help with development of databases and services of the Center.

B. Sources of staff - NAL has arrangements in place for obtaining staff appropriate to this program. Such arrangements include: direct hiring of one, or possibly two, key individuals against the NAL ceiling cooperative agreements with the University of Maryland, Iowa State University, University of California - Davis, and other land grant universities; awarding of grants; assignment of interns; visiting scholars, professors, and librarians; use of overtime pay for some current NAL staff with special skills, etc.

C. Budget - The PGC Coordinator is responsible for working closely with the Office of Plant Genome Research and NAL's administrative offices in administering the budget for the Data and Information Center.

VIII. PROMOTION - Services of the PGC will be advertised to the scientific community and other likely audiences through promotional publications, news items in journals, presentations and exhibits at national and international

meetings, and the newsletter described in V.D.1.

IX. PHASED DEVELOPMENT -

A. FY 90 Tasks/Projects and Personnel Actions

1. support preparation of Data Resources and the Plant Genome Research Program, a report of the Plant Genome Database Subcommittee, Science and Technology Coordinating Committee, USDA Plant Genome Research Program.
2. serve on variety of committees and attend meetings relative to genome mapping and informatics, including: NIH/DOE Joint Informatics Task Force, GenBank Advisors Group, and meetings sponsored by Bio-MATRIX, the National Academy of Science, and the American Association for Artificial Intelligence.
3. establish Plant Genome Research Team from existing NAL staff to plan for, and initiate preliminary activities until staff are hired.
4. develop roll-out plan for FY 91.

B. FY 91 Tasks/Projects and Personnel Actions

1. Establish PGC.
 - a. Hire and train PGC staff
 - b. Plan space for Center, purchase and install furniture and equipment.
 - c. Develop reference services of the Center and referral network of researchers and others interested in the plant genome effort.
 - d. Develop and publish brochures, other promotional materials, and guides as needed to meet information needs of user community.
2. Improve NAL collection.
 - a. Conduct evaluation of NAL collection of materials related to scope of Center
 - b. Acquire and catalog publications.
3. Improve coverage of AGRICOLA and accessibility of

information in AGRICOLA.

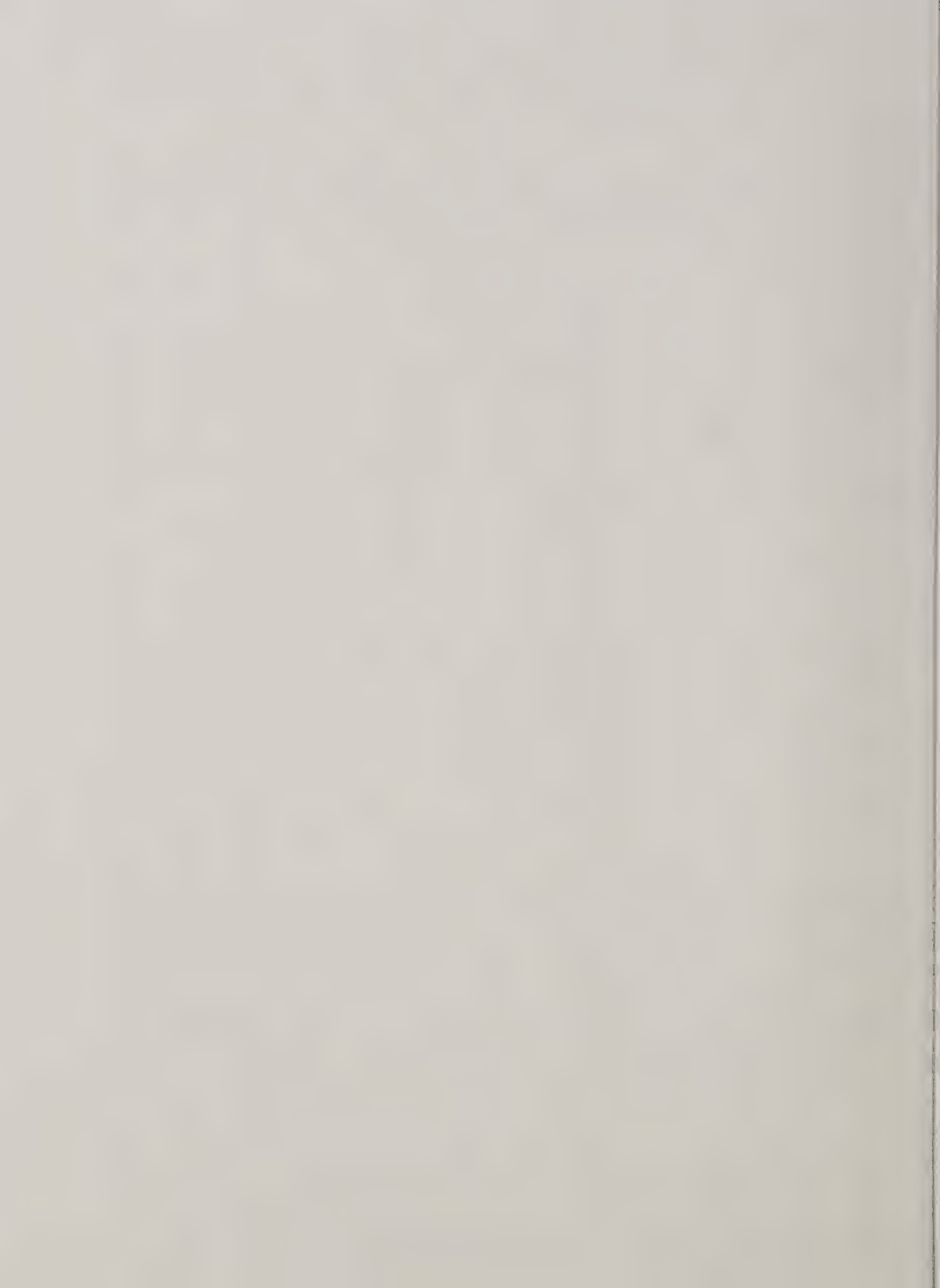
- a. Conduct evaluation of comprehensiveness of coverage of AGRICOLA for materials related to scope of Center.
 - b. Add records to AGRICOLA for items acquired in 2 above.
 - c. Evaluate and modify indexing terms to improve access.
 - d. Add abstracts to new records in AGRICOLA.
4. Plan for development of NAL-produced scientific database(s) and new bibliographic products.
- a. Establish mechanisms for marking AGRICOLA records to create plant/animal genome subset.
 - b. Plan plant/animal genome bibliographic database/products. Produce first issues before end of year, if possible.
 - c. Establish procedures for "stockpiling" information to be added to NAL database(s) when database structure and elements are determined.
 - d. Continue assessment of user needs begun by database subcommittee.
 - e. Based on needs assessment, determine nature of database(s), structure, file elements, and means of "pointing" to information in other databases.
 - f. Collaborate closely with NLM and other database producers to maximize availability of information and minimize duplication of efforts.
5. Plan modes of access to new database(s).
- a. In collaboration with ARS, develop mechanism of distribution of database(s).
 - b. Collaborate with ARS to establish computer system requirements and initiate procurement process.
6. Facilitate communication among researchers and

others interested in genome efforts.

- a. Plan electronic directory to plant genome resources and begin compiling information for directory. Implement plan as soon as possible.
- b. Evaluate options for end-user access to electronic directory. Develop plan for implementing option chosen.
- c. Design newsletter. Send out first issue no later than 4 months after budget is received.
- d. Continue representation on committees and at meetings described in FY 90 description and others appropriate to this effort.

NON-SALARIES

POSITION		TRAV	TRANS	RENT/ COMM	PRINT/ REPRO	EQUIP/ SUPP	MAINT	COM- TRACTS	OTHER	TOTAL NON-SALARY	TOTAL SALARY	SUM SALARY +NON-SAL.	ADMIN.	TOTAL
GRADE BASIS (GS)														
Salary (based on 1990)														
8.5 months salary +														
benefits (30%)														
# positions														
TOTAL \$										420500	448411	868911	140000	1008911
ESTABLISH PCC	FTE													
\$		16000	0	30000	10000	52500	0	0	17500	126000	16313	144313	23252	167565
hire/train staff/	FTE													
prof. dev.	\$	16000	0	0	0	0	0	0	10000	26000	0	26000	4189	30189
space/furn./equip	FTE													
\$		0	0	30000	0	52500	0	0	0	82500	0	82500	13292	95792
ref.serv/network	FTE													
\$		0	0	0	5000	0	0	0	7500	12500	14968	27468	4426	31893
brochures/promotion	FTE													
\$		0	0	0	5000	0	0	0	0	5000	3346	8346	1345	9690
IMPROVE MNL COLLECTION	FTE													
\$		0	0	0	0	0	0	0	135000	135000	58996	193996	31257	225253
eval. coll.	FTE													
\$		0	0	0	0	0	0	0	10000	10000	10243	20243	3262	23504
acquisitions &	FTE													
cataloging	\$	0	0	0	0	0	0	0	125000	125000	48753	173753	27995	201749
IMPROVE AGRICOLA	FTE													
\$		0	0	0	0	20000	0	0	7500	27500	104210	131710	21221	152932
eval. AGRIC	FTE													
\$		0	0	0	0	0	0	0	7500	7500	24565	32065	5166	37231
add records/AGRIC	FTE													
\$		0	0	0	0	0	0	0	0	0	38196	38196	6154	44350
eval/modify indexing	FTE													
\$		0	0	0	0	0	0	0	0	0	25658	25658	4134	29792
add abstracts/AGRIC	FTE													
\$		0	0	0	0	20000	0	0	0	20000	15791	35791	5767	41558
PLAN DB(S)/PRODUCTS	FTE													
\$		15000	0	0	10000	20000	0	5000	0	50000	134660	184660	29753	214413
create subset	FTE													
\$		0	0	0	0	0	0	0	0	0	22233	22233	3582	25815
bibl.db/products	FTE													
\$		0	0	0	10000	0	0	5000	0	15000	28223	43223	6964	50187
stockpile	FTE													
\$		0	0	0	0	20000	0	0	0	20000	16500	36500	5881	42381
user needs assess.	FTE													
\$		10000	0	0	0	0	0	0	0	10000	24723	34723	5595	40317
db components	FTE													
\$		0	0	0	0	0	0	0	0	0	37083	37083	5975	43058
collaborate	FTE													
\$		5000	0	0	0	0	0	0	0	5000	5898	10898	1756	12654
PLAN ACCESS	FTE													
\$		2000	0	0	0	0	0	0	0	2000	14913	16913	2725	19638
dev. distribution mech.	FTE													
\$		0	0	0	0	0	0	0	0	0	6691	6691	1078	7769
estab. system req.	FTE													
\$		2000	0	0	0	0	0	0	0	2000	8222	10222	1647	11869
FACILITATE COMMUNICATION	FTE													
\$		10000	0	0	6000	0	0	4000	0	20000	60178	80178	12918	93097
directory	FTE													
\$		0	0	0	0	0	0	0	0	0	26319	26319	4241	30559
end-user access	FTE													
\$		0	0	0	0	0	0	0	0	0	18511	18511	2983	21494
newsletter	FTE													
\$		0	0	0	6000	0	0	4000	0	10000	7484	17484	2817	20301
meetings/outreach	FTE													
\$		10000	0	0	0	0	0	0	0	10000	7864	17864	2878	20742
OTHER	FTE													
\$		0	0	0	0	0	0	0	60000	60000	57140	117140	18874	135514
TOTAL TIME (FTE)	FTE													
TOTAL \$	\$	43000	0	30000	26000	92500	0	9000	220000	420500	448411	868911	140000	1008911



Summary of non-salary costs (by activity)

- 1.a. hire/train staff/prof. dev.
Assumed 0 personnel costs because existing personnel would do this.
Travel - cost of bringing candidates for professional positions to NAL for interviews and sending staff away for training and for travel related to professional development and off-site training.
Other - 10000 to pay back NAL units involved in training PGC staff (e.g., indexing, cataloging, etc.)
- b. space/furn./equip.
rent -based on \$10/sq.ft. and 200 sq.ft/person, excluding students (per T. Neis).
equip.- 11 workstations at 3500 ea. + 10000 additional furniture (files, desks, chairs) + 4000 supplies.
- c. ref. serv./network
prt/rep. - Center publications (excluding promotional materials), e.g., QB's.
other - database searching.
- d. brochures
prt/rep. - cost of printing brochures and other promotional materials.
- 2.a. eval. coll.
other - database searching
- b. acq/cat.
other - purchase of materials for collection (125,000)
- 3.a. eval. AGRIC
other - database searching
- d. abstracts to AGRIC
equip. - scanner (20000)
- 4.b. bibliographic database/products
prt/rep - cost of producing publication
contracts - artwork/design, etc. for publication
- c. stockpile
equip - copier (10,000), WORM (10,000)
- d. user needs assessment
travel - cost of bringing user's to NAL to meeting on user needs or cost of sending personnel out to talk to users.
- f. collaborate - travel to meetings related to collaboration or to visit other genome-related groups.
- 6.c. newsletter
prt/rep. - cost of printing newsletter
contract - artwork, possibly writing of newsletter.
- d. meetings/outreach
travel - attending meetings
7. other
other - 40000 to cover unexpected; 20,000 for systems support at NAL.

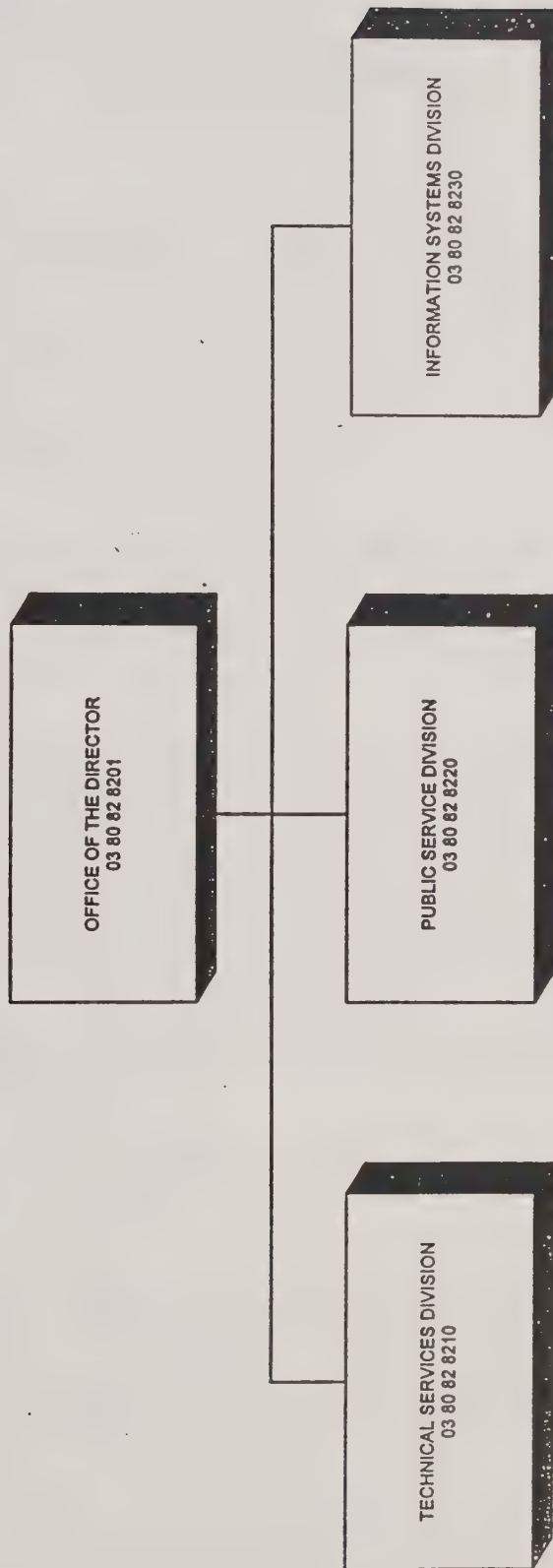
AGRICULTURAL RESEARCH SERVICE NATIONAL AGRICULTURAL LIBRARY

RECOMMEND: Carole R. Caudle
Director, National Agricultural Library

CONCUR: Gene L. Diles
Deputy Administrator, AFM

APPROVED: David A. Horn
Administrator, Agricultural Research Service

DATE: MAR 28 1996



MISSION: To serve as the Nation's chief Agricultural Information resource by providing agricultural information products and services through traditional library functions and through modern electronic dissemination to agencies of the USDA, public organizations and individuals. The NAL provides a leadership role in U.S. participation in international agricultural library and information systems and in efforts to promote worldwide availability of agricultural information.

Supersedes Chart dated August 28, 1990

Prepared by: HRD Systems Staff

NAL TECHNICAL COMMITTEE MEETING

National Agricultural Library

Beltsville, Maryland 20705

July 10-11, 1991

NAL's Technical Committee Meeting opened with a description of USDA's Plant Genome Research Program by Jerome (Jerry) Miksche, meeting co-chair and program director. The Program's goal is to locate, transfer, and express genes of economically important crops. Approximately 400 scientists working on over 70 agronomic species at state experiment stations and land grant institutions have received \$20-30 million per year since 1988-1989. In FY 91, \$14.674 million was allocated to the U.S. Genome Project--\$11 million for competitive grants and \$3.674 million for a database and its allied support functions (17-20 percent). (Funding for the database ideally should be at 30 percent.)

The species groups chosen to define, establish, and develop relational databases are: Pine (David Neale), Wheat (Olin Anderson), Soybean (Randy Shoemaker), and Maize (Ed Coe). With coordination provided from NAL's database group, the four species groups are to establish a generic relational database across all species in a period of about 6 years. Jerry described activities for each of the 6 years. He closed by indicating that there will be an annual meeting of the competitive grants awardees to present their progress.

David MacKenzie, meeting co-chair, described on-going activities that address future resource needs for biotechnology on a governmentwide basis. Currently there is a "cross cut" study encompassing all Agencies to determine precisely what is going on in biotechnology and how much money is being spent. The study focuses on investments in biotechnological research in the areas of agriculture, the environment, engineering applications, human health, and every possible combination. Agencies are examining their current investments using a broad definition developed by the Office of Technology Assessment in a 1988 report that covers all types of research on the use of life forms for the development of new organisms or products from those organisms. The initiative is slated to gear up in October 1992. The impact of these investments are still being determined. The benefits will need to be studied and tracked.

NAL's Associate Director for Public Services Keith Russell welcomed everyone on behalf of NAL Director Joseph Howard and presented background information on the Library's role in the plant genome program.

Douglas Bigwood, database manager for NAL's Plant Genome Data and Information Center, gave a brief introduction and stated that the focus of the meeting was to derive a set of goals to guide the development of the database (for example, how the finished database should look, what kind of interfaces should exist to external databases, and how users should access the data) and to establish a rough timeframe to accomplish these goals. The proposed approach to the database design and implementation is phased development.

The content of the database and needs analysis are currently being determined by the ARS cooperator prototyping advisory groups and others in the user community. The present working idea is to have the plant mapping data (linkage, physical, and RFLP) as the core subject data. The main mapping activity and the coordination of information between mapping, sequencing, and stock centers will be accomplished at NAL.

It was suggested that an additional area to be added to the agenda was maintenance of

the database. The question was raised as to who will provide quality control and continued support.

I. Discussion Points

- Before the structure is defined, it should be determined whether the database is intended to be "Observations" or "Truths." Truth is more editorial; observation is not as much work. A layered architecture would provide a stable layer of observation.

- A database of maps would be very helpful. One vision of the Plant Genome Research Program is not just maps, but the underlying physiological data as well. When a sequence is put into the database should the old versions be kept, edited, or archived?

Comment: Genbank will keep what authors think is correct.

Comment: There should be three levels in the database: 1) raw data; 2) maps from raw data (interpretive) with public statement from the lab; and 3) official maps. It may not make sense to store raw data in the central database.

- Computer readable data does not go through the same classical peer review process as literature. The content should go through some form of quality control. Would the database be able to reject a submission?

II. Discussion on the Database Content

- The cooperator prototyping advisory groups are presently conducting or have conducted preliminary needs assessments that indicate:

The **Wheat Group** wants images, every image from every lab. Initially labs will work on linkage groups.

The **Maize Group** wants maps based on truths and observations. Summarized information can be derived from the raw data. The database can be based on summary only. But that may provide insufficient information for the user.

The **Pine Group** wants to see a database based on summarized information that has been derived from the raw data. Each cross has its own map for segregating populations.

The **Soybean Group** agrees with the other Groups. Tiers of quality information should be in the soybean database. They would like to store data on transient populations as well as permanent populations but on a different level. The research population has indicated that there is a need for the best interpretation with access to raw data. They want images, RFLP probe sequences, and patterns for the five core species.

A comment was made that 20-30 years from now there may not be much need for experimental data but the derived results can be reused in new ways. As a cost consideration, information could be flagged then deleted in the future if not needed. It might be useful to look at some other disciplines like materials properties that have already gone through this process.

- Should there just be pointers to the information or should everything be stored? If

everything is collected, where will it all be stored?

- What is NAL's role? If everything is collected, then the data will have to be interpreted. Would NAL interpret the data? It has been proposed that the core groups will rank information then send it to NAL. The Library should publish more than one version of the same map and help develop the tools for database development. Some type of volunteer editorial board would be needed. GenBank and NLM are good examples.

- Should there be a requirement of publication of the results of research from the Competitive Grants Program? How do you get compliance? The trend now seems to be to build more accountability into the system. Also, there are more voluntary submissions.

III. Discussion on the User Community

- Categories of users have been identified by the prototyping groups--basic researchers; applied researchers such as post harvest physiologists who try to manipulate genes for engineering; breeders; educators; the general public; and other automated systems/software. There is a need to be able to access other systems in automated procedures. Commercial vendors and developers should be considered. The legal/government community might be a potential user (legislation or patents).

- Basic and applied research could cause divergence. Tailoring the database to one group would be a mistake; therefore, the lowest common denominator should be used.

- A scientific database model should reflect reality. Core databases should be established that reflect cross disciplines. Also, the database should not be designed for a particular output.

- Is there a clear statement of the purpose of the use of the database? It is still being defined. In both the soybean and wheat databases, the utility is not in summarized map information but on segregation, types of markers, germplasm to construct matings, and location of quantitative traits. *Arabidopsis* data needs the lowest level of electronic data storage. In general it is genetic, comprehensive, archival, and dynamic. The basic researcher would like to see the integrated maps, RFLPs, isozymes, consensus maps and background leading to it, sequences, phenotype, closest neighbors and markers, probes, and sequence tagged sites. How these genes interact in different backgrounds, cDNAs similarities to other plants, and function of the genes are also important.

The prototyping groups have prioritized very specifically what each discipline considers important and what will be undertaken first. Getting the genetic maps, RFLP and classical, into the database first is the highest priority on everyone's list. Nuclear cytoplasmic interactions are a much lower priority. The genetic core would include a description of genetic stocks, sites for mapping, pedigrees of stocks, gene products, and molecular markers.

- The question was raised as to how much information on genetic stocks should be included. Experience with *E. coli* stocks was presented for discussion. Interface with stock center databases should be addressed.

As core data, genetic stock center information is as important as the maps, but most of this information is not currently available electronically. Stocks to be included should come from the appropriate community. Also, stocks should be preserved for posterity to ensure

continuance.

- Use of generic software for development enhances the ability to respond to future needs to accommodate increased workload. It may be more expensive in the short-term but is cost effective in the long-term to meet the needs of the community. Higher level computer-aided software engineering tools should be used for database development.

- Realistic goals should be viewed in terms of available funds. Future growth potential should be considered. There is a need to ensure accuracy of entered data.

IV. Discussion on Data Flow and Evaluation

- The working concept is that initially all work will be funnelled through the species groups. The workflow will be formalized in the future. The Library will not have an evaluation/review function. Perhaps expert systems could be developed in the future for first level review.

V. Discussion on Proprietary Information

- Confidential and proprietary submissions were defined and discussed. There is a need for a policy statement. At this time the thought is that information for the general public will be contained in the database. However, security and access controls are needed since some classes of data may be restricted for the common good.

VI. Discussion on Interfaces with Other Databases

- **GenInfo:** The history of GenInfo Backbone and its relationship to GenBank was presented as well as its structure and content. The database is to be distributed on CD-ROM and through INTERNET. NLM is working with NAL to ensure coverage of plant science entries. Patents are being included in the GenInfo Backbone. "Indexed sequences" are being included to facilitate retrieval of related literature. The need to standardize nomenclature was mentioned. Pre-release CD-ROMs contain information from Medline, PIR, and GenBank, allowing retrieval of bibliographic records and their related sequences.

- **GenBank:** A database effort should be designed to be scaleable. Most of the data appears in the database prior to publication. The amount of confidential data is small. Electronic publishing was discussed as it relates to GenBank. Cross-links to other databases are viewed by what is the proper domain for each database. The domain for GenBank is the nucleotide sequences. External sources are relied on for other information by pointing to entries in other databases. A registry system has been proposed to accommodate timelag between databases. Software can be written for user interface between GenBank and other databases. Interfaces should accommodate machines as users. Sybase is being used as a client server interface in the human genome community. The structure should have protective layers so that if Sybase is no longer available effects will be minimal. Agencies should look at combined research efforts to find common interfaces. The Library should have a satellite setup of sequence databases with a standard language format like ASN1 for distribution, an application format interface, and adequate documentation of computer activities.

- **GRIN:** GRIN was established as a central repository for plant germplasm to enhance communication and to collect and make available accurate data. Maintenance sites (22), which are responsible for entering data, drive the direction of the database. Agronomic and

morphological data are currently accessed on a worldwide basis (data are protected). Genetic stock data on barley and soybean will be entered into GRIN. The current database system will be converted to a new hardware and software platform within the next 2 years. Currently there is no interface with other databases. During the developmental phase there were at least seven to eight designs before three to four prototypes were combined into one database.

There are cooperative efforts with the Soviet Union and India. Plans are underway to cooperate with China. GRIN, which catalogs the accessions of the National Plant Germplasm System, is readily accessible by PC using KERMIT communication software.

Timely submission of data to GRIN is motivated by communication from the Germplasm Office National Project Leader (Henry Shands), who informs project participants what is needed and in what timeframe.

What data not currently contained in GRIN should be considered for inclusion in the Plant Genome database? Detailed information on genotypic diversity and how molecular diversity relates to pedigree is not being captured.

- **AGRICOLA:** Although currently available on CD-ROM, DIALOG, and BRS there will be a 1-year pilot project to load AGRICOLA on computers at Clemson University using INTERNET. AGRICOLA covers U.S. data and AGRIS covers foreign data. The Library is responsible for co-maintenance of the CAB Thesaurus. Linking AGRICOLA to the Plant Genome database will not pose a problem.

Perhaps a value added CD-ROM could be developed, like GenInfo, where AGRICOLA/MEDLINE plant bibliographic data could be linked with plant sequence data. CRIS (Current Research in Science) records can also be tied into the database since there is a record for each research project.

VII. Discussion on Interfaces (On-Line Access)

- **Hardware -- INTERNET (Dial-up Access):** INTERNET will be utilized. The GenInfo Backbone will be experimenting with FTS 2000 800 numbers during the next 2-3 years due to the loss of TELENET. They are encouraging users to buy software to run on their own machines. Potential Plant Genome users should be surveyed for dial-up access.

- **Software:** Experiments are being conducted at the Department of Energy with software that will run at 9600 baud to work with Microsoft Windows. ASCII and graphic interfaces represent parallel development efforts. ASCII is a throwaway after 3 years. Perhaps instead of utilizing resources to develop interfaces, ASN1 could be utilized with the development of end use PC software.

- **Should images be stored and, if so, in what format?** CD-ROM is the least efficient way to capture images. Images are non-core information. NREN (National Research Education Network) will be able to make very high band-width connections available between points on INTERNET that would allow images to be transmitted in a reasonable amount of time. Cost/benefit analysis should be conducted to determine whether graphics should be included for a first pass interface. Users should be queried again to determine true need.

NAL has been putting images up on INTERNET for Document Delivery for about a

year. It takes a considerable amount of time on the telephone line. Autorad images could be graphically represented numerically to lower transmission costs.

VIII. Discussion on Other Networks

- An E-mail interface (BITNET approach) is critical. GenBank is currently using E-mail. There should be some type of interactive access. FTS 800 telephone numbers could provide this at a relatively low cost. Possible service charges were discussed. A small fee would deter hackers. Access through INTERNET is difficult for foreign users at this time; E-mail would be easier.

Should there be other mechanisms besides E-mail to download data? The applications programming interface ASN1 should be considered to send out data. Output should be parsible in machine-readable form and able to be captured on disk.

IX. Discussion on Tools for End Users

- The present working philosophy is that not much will be provided in the way of tools for data manipulation. The application program interface will allow users to develop their own tools.

The possibility of developing some set of analytic tools that would be helpful for data selection should be examined. (Something to help focus searches.) There should be some tools for novice users and user support. The interface design should be documented for consistency.

X. Open Discussion

- Nomenclature: The same gene in different organisms should have the same name to facilitate searching for data. A core name should be able to recover all alleles. This needs to be done before it becomes uncontrollable. As more computer systems become available there will be less resistance to standardizing nomenclature. All names should be conserved (historical and current). There must be some consensus process. A standing subcommittee for nomenclature should be appointed.

There is a need to build in a thesaurus capability. The International Society of Plant Molecular Biologists will be addressing this issue at their October meeting with hopes to establish links with this database effort.

- Off-Line Database Access; CD-ROM as a distribution medium: The currentness of the data determines off-line access. There is a tradeoff between up-to-date hybrid mode CD-ROM and file servers to give updates. CDs are an economic way to distribute data in a short time period. A set timeframe may not be feasible at the beginning. It should depend upon the amount of new information available. CD-ROM release data in ASN1 format with value added computing should not be taken on immediately. Whether or not the cooperators will be responsible for curation and value added activities needs to be determined.

The International Society for Plant Molecular Biology has ambitions to be responsible for curation and valued added activities for the international community. The Society has discussed the feasibility of setting up an office to deal with all aspects of plant molecular genetics, specifically gene sequences and gene function, which will be totally linked to

existing databases.

GenBank is distributed via paper, magnetic tape, and CD-ROM, and is also available on USENET.

CD-ROMs are recommended for data distribution as opposed to magnetic tape due to time and money limitations.

■ Off-Line Database Access; Satellite Nodes: Foreign scientists (Europe and Japan) have expressed an interest. CD-ROM might be the best mode of transmission for satellites. Perhaps satellites should not be dealt with until there is a significant workload. The Competitive Grants Program could be used to encourage INTERNET connections. International collaborators have not yet been decided upon but will be sometime in the future.

XII. Discussion on USENET News Groups

■ USENET News groups, available over the INTERNET, utilize specific software that makes news items read like a distributed electronic bulletin board. There should be public forums for the project because more contact means more ideas. The Plant Genome Data and Information Center Newsletter will be utilized for user education. The Newsletter will have an electronic version in the future.

XIII. Other Topics

■ John McCarthy, LBL, discussed issues and questions that face the Library and each prototype group. Other questions that still need to be addressed are:

- There are various ways to use relational databases. Will the authoritative version of the database definition be kept in the form of SQL statements and relational tables or at a higher level? What sort of interface? Without a good interface not many people will use the database. What sort of windows? What sort of interaction style? To what extent are graphics going to be passive or active? How will the interface be implemented? How will these questions be answered? How is the labor divided?

- Database tools such as ERDRAW help productivity during database development. These tools, although still in the developmental phase, can leverage limited resources. Plant Genome has been reviewing and investigating as many sources of these tool as possible.

- Once the core information has been determined, is there a timeframe for implementation?

- Within a year, the individual groups and the central database group expect to have their prototypes designed and some data loaded. The decision had been made in a previous committee that a multiple group effort would be used because of the diversity of information. The groups plan to have their prototypes ready for evaluation and integration by March 1992.

Introduction

The Plant Genome Data and Information Center (PGDIC) was established in FY'91 at NAL with a mission to serve the plant and animal genome research community by providing relevant information in a variety of formats; creating databases suitable for genomic information; strengthening the NAL genetics literature collection; enhancing the AGRICOLA database; and promoting communication among researchers and other parties interested in genome research. (See Section 1, Reference 2.)

Over time the scope and direction of the unit has changed as the program has matured. We continue to perform the primary goals laid out in 1990 prior to establishing the Center, adjusting priorities as needed with tasks added to meet the new challenges and opportunities provided by advancing technology.

Since the early days of the Program, communication with the research community has been at the core of PGDIC operations. In addition to exhibits at conferences and presentations, we have regularly communicated in print with our potential user groups, including the development of specific products through our analysis of PGDIC reference requests. (See Appendix 1.) We have met each new technological opportunity and are prepared to continue moving forward and exerting leadership in the information and scientific communities. FY'93 saw the expansion of e-mail and the development of gopher. When in August 1994 NAL made public its gopher-server, PGDIC materials were among the first loaded; and by mid-FY'95 NAL added a World Wide Web (WWW) server and a new home for PGDIC electronic resources. These changes in electronic communication and data delivery have brought us closer together in the global community and are changing the way we do business.

Despite some changes in our programs and projects our principal mission remains to serve the information needs of the genome research community, a goal to which we have remained totally committed. Due to the nature of that mission, soliciting user feedback is an integral aspect of all our activities. Owing to the number and diversity of our projects, we will address our specific mechanisms for gathering and incorporating user feedback in the context of individual project descriptions, which follow.

PGDIC Accomplishments and Activities

Projects Prior to FY'96 - FY'97

Database Services

Since the early days of the Program through the present, PGDIC has provided instructional and outreach support for the various species databases, including the creation of information products

supporting the current state-of-the art technology for the online databases, the distribution of the companion CD-ROM product, and the provision of specific reference services for the individual databases upon request. Beginning in FY'97 PGDIC welcomed the priority given by Dr. Shands on inclusion of data from minor crops, and sees it as a renewed challenge to a focus we had already embraced. We have since increased activities to meet that challenge.

Database Training Program

As the species databases developed, end-user training has become more important. In December 1994, PGDIC staff met with Drs. Miksche and Heller to outline a phased approach to a training program.

Phase I: It was recognized that many scientists at that time had only limited access, much less training, on the more sophisticated gopher and WWW-based Internet resources. With this in mind, the Phase I course focused on the most basic technological level for interfacing with the databases -- e-mail. We also used this opportunity to train scientists in the use of two other important e-mail servers, The National Center for Biotechnology Information (NCBI)'s BLAST and RETRIEVE, as these data resources are vital to nearly all genome researchers.

Dr. Andrew Kalinski took the lead in the training program by developing the course outline and creating a significant training manual. The manual and course materials were reviewed by the staff of NCBI as well as other ARS scientists and NAL employees.

Initial demand for the course proved high, and course evaluations were overwhelmingly positive. One participant said that it was the best training course offered by ARS in the 10 years of his/her employment in the Beltsville Area. (See Appendix 2 for a summary of participant evaluations.) A follow-up telephone survey conducted several months after the first courses confirmed that the majority of participants were still using the e-mail servers. The survey and evaluations also generated valuable feedback on the training manual.

Dr. Kalinski unfortunately died October 7, 1995 after a short illness. In the subsequent 18 months since Dr. Susan McCarthy and Barbara Buchanan have absorbed the training program, the manual has been updated several times, including a major revision, based on user feedback, for the December 1996 class.

Phase II: Using the WWW-interfaces to the Plant Genome databases is the focus for the Phase II Database Training Program. In late FY'96 through early FY'97, Edyth Paul, Curator of the RiceGenes database, developed an in-depth course outline for the Agricultural Genome Information Server (AGIS) WWW site, based on her experience with developing an instructional manual for the RiceGenes Database.

PGDIC sent an outline to each database curator and Principal Investigator (PI) for comment and review (highlighting their sections for convenience), followed by a formal meeting of available curators and PIs at the Plant and Animal Genome V Conference in January 1997. Based on this review process, the group decided to make the manual primarily an on-line tutorial with examples

from every database. Time and resources permitting, we plan to complete the manual/tutorial in time for the next Plant and Animal Genome Conference with the hope of formally introducing conference participants to the resource.

Data Acquisition for Species Databases

Since 1992, PGDIC has offered to supply supplementary data to the species databases. These data included specialized searches in literature databases of AGRICOLA and BIOSIS; nucleic acid sequence retrieval from GenBank; and Current Research Information System (CRIS) funded project records. The first databases to select these services were SoyBase, AatDB and MaizeDB.

Over the next few years additional databases became active in similar reference requests, including Cotton, Rice, Alfalfa, Apple, BeanGenes, and GrainGenes. Each database has very specific reference needs requiring individualized, often complex, searches. Curators and PIs have all been fully involved in refining the searches for their databases.

A notable example is the work that Barbara Buchanan has done with Marcia Imsande and David Grant on the SoyBase Metabolic Pathways. Each enzyme had to be searched individually, with special subject category codes added to limit the results primarily to plant-derived enzymatic references. Marcia Imsande has found that, as a result, their metabolic pathways database has been incorporated into such distantly related specific species databases as *C. elegans*.

Database Information Services

Even before the databases were released to the public, PGDIC promoted this developing resource through oral and written presentations to the scientific community. When the Plant Genome Databases were released to the public as WAIS-indexed files on a gopher server in December 1993, PGDIC developed various informational products in both print and electronic formats to support basic access and searching, and provided one-on-one, in-depth training sessions at conferences. During FY'94, well over 200 in-depth training sessions had been provided. Finally, PGDIC promoted the activities of the species databases through funding travel to meetings for species database curators, and providing conference booth space with equipment and telephone line access to any interested species database curator or PI.

Outreach Activities

Outreach activities include many different formats and venues, from promotional materials and newsletters to conference exhibits, presentations and demonstrations.

***Probe*, the Official Newsletter of the Plant Genome Research Community**

One of the first tasks given to PGDIC by Program Director Dr. Miksche was to develop a newsletter that could be used as a marketing and educational tool for the genome community. That newsletter was officially established and launched in FY'91.

The newsletter was an excellent vehicle to inform the research community of new developments in the database(s), technical research developments, important grant deadline information, and a few items of general interest. By FY'94 the subscription list had grown to over 4,000, approximately 20% of whom were international readers.

Probe was well received by the community. A scientist once remarked that she learned the value of the newsletter when, waiting on the phone, she scanned an issue and discovered that the deadline for the Plant Genome Grants was earlier than she had been told by the staff at the grant's office, and that the *Probe* included an article on an experimental technique that she had just heard about and was going to look into for her own research.

In 1995, PGDIC developed a comprehensive readership survey for *Probe* that was fully endorsed by USDA. The survey was conducted as a one-time mailing in Vol. 5, No. 1/2 of *Probe*. The results revealed a very good overall impression, and some excellent suggestions for future articles. (See Appendix 3 for analysis of the survey data).

NAL was directed in July 1995 to cease publication of the newsletter. Due to procedural uncertainty regarding the closing of the publication, the last issue was printed and distributed in October 1996. Our continued receipt of requests for *Probe* subscriptions underscores the quality and professionalism of this publication. PGDIC maintains active outreach and communication with our users through our newly created pgenome-announce listserv, which helps to keep the community informed of important grant deadlines, database developments, training schedules, and other relevant information previously provided by *Probe*.

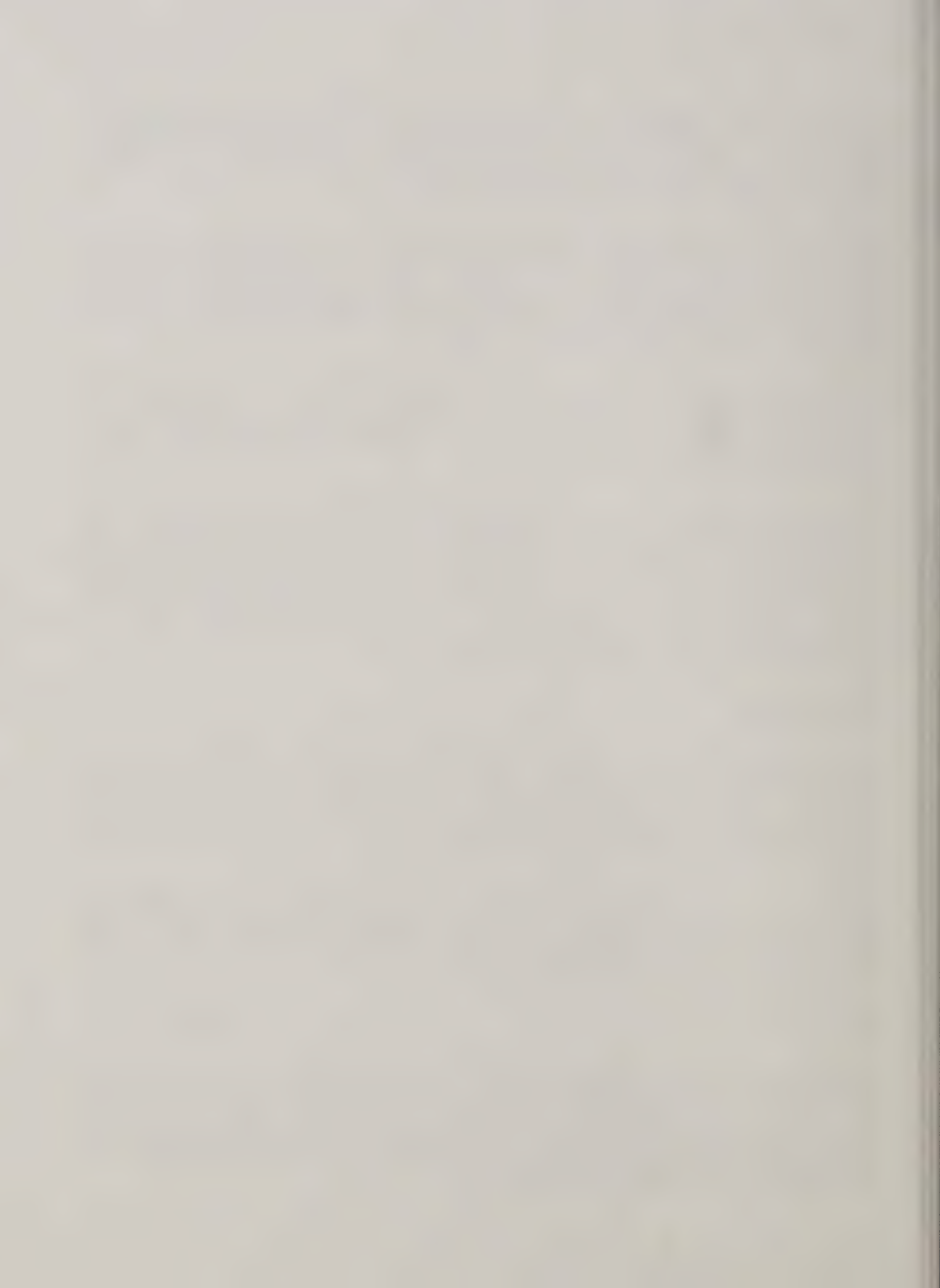
Presentations:

In April 1996, Dr. Susan McCarthy gave an invited talk to the Tuskegee Workshop presenting Agriculture as a cutting-edge field and the Plant Genome Databases as the beginning of a new discipline called "bioinformatics." The principal role of the workshop was to bring young African-American and other minority students up-to-date on the latest plant biotechnology research, and to encourage the students to consider plant sciences as a career.

In 1994, Dr. McCarthy gave an invited presentation on access to biotechnology information at the International Conference on Strategic Information in Biotechnology, Research Triangle, NC. That year, Dr. McCarthy also organized the Biotechnology Roundtable program for the Biological Sciences Division, Special Libraries Association.

Exhibits:

Most exhibits take place at scientific conferences which offer the ability to interface with many scientists at one time in a friendly setting. It was at one of these conferences that user feedback led us to develop a specialized database describing plant DNA libraries, confirming the need that many written, telephone, and e-mail requests had also suggested as a valuable tool for researchers. See <http://www.nal.usda.gov/pgdic/dnalibr/>



On average PGDIC has exhibited at 7 conferences each year. The single highest year was 1994, with 12 exhibits, and the lowest year will be 1997, with 4-5 exhibits. A detailed exhibit break-down is provided in Appendix 4.

Publications:

PGDIC has produced a variety of publications since 1991. These publications have included fliers, training manuals, quick bibliographies and other information resources. For a complete listing of PGDIC's print and electronic resources, see <http://www.nal.usda.gov/pgdic/qblist.html>.

PGDIC has developed two new series of publications at NAL. The first to be developed was a desk reference tool for nucleic acid sequences by species. The series has continued to grow and has been regularly updated. Our work on these tools has led NCBI to change some of their user interface parameters, and they have continued to work with us on handling large files. These publications have generated tailored reference requests for specific species not covered in our series. Although more current information is available via the WWW, our print versions have proven valuable to that sector of our user population with either slow (or non-existent) network connections, or those unwilling to wait for connection during peak hours.

Our second publication series consists of subject-oriented compilations of USDA-funded research projects, with corresponding short bibliographies. Researchers use them to identify projects already funded, colleagues to collaborate with, and research resources. Students use these documents to look either for graduate labs or possible postdoctoral appointments. Many of these publications were initially compiled by Dr. Kalinski, and we are currently updating and providing newly available digital access to them, as well as adding new titles to the series.

Plant Genome Research Program -- Archives:

PGDIC provides a valuable archive of Plant Genome Research Program activities, including complete lists of Program Grant Recipients, and a bibliography of significant publications compiled from the 1991 list of Program Grant Recipients. Similar bibliographies will be prepared and updated for the succeeding years of awardees. We also recently digitized the Program Guide written by Dr. Miksche and are working with the ARS Information Staff to obtain the graphics and permission to include the publication on our WWW site.

Major Collaborative Efforts

In FY'94, a three year project was concluded among NAL, the National Library of Medicine (NLM), and NCBI, to help identify which journals had published sequence information that was not being regularly captured by NLM. Participants at NAL included Current Awareness Literature Service (CALIS), Indexing, and PGDIC. Together we scanned a number of databases, including AGRICOLA, BIOSIS, Government Reports Announcements (GRA), and Commonwealth Agricultural Bureaux (CAB) International. As a result of our work, a number of journals were recommended to NLM's Indexing Advisory Board. At the end of our three year collaboration, it

was determined that NLM was capturing about 95% of published sequence information and the project was concluded. (See Appendix 5.)

PGDIC has also collaborated with the *Arabidopsis* Multinational Steering Committee in collecting information for their annual reports. This information has been included and acknowledged in the last two reports. (See Appendix 5.)

PGDIC has also recently begun a major collaboration with CSREES, CRIS to maintain links from our electronic archive of Plant Genome grant recipients to the corresponding records in the CRIS database.

Finally, PGDIC has worked closely with other Branches within NAL to better serve the needs of the Plant Genome Research Program. Several major studies have been conducted to help evaluate the AGRICOLA database for plant genome content. As a result of these studies, the *Journal of Plant Molecular Biology* was selected for comprehensive indexing (including 6 years retrospectively) and 9 other journals for selective indexing. This analytic information was also made available to the Acquisitions and Serials Branch for selection purposes along with ongoing recommendations for more than 50 new serials titles for addition to the collection.

When the Animal Genome Research Program requested a special analysis of the animal genome content in AGRICOLA, PGDIC staff worked closely with Dr. Joan Lunney to conduct a survey. Survey results were presented to Shirley Edwards, Head, Indexing Branch.

Current Projects and Activities FY'96 - FY'97

Several projects were initiated late in FY'96 and are continuing into FY'97.

Support for Minor Crops:

1) Barley Wolf Pack Project: Drs. José Costa and Pat Hayes are developing an educational/research tool using the Wolf barley lines. PGDIC scanned a test set of slides from which photographic standards were set for this last growing season. The test can be viewed at <http://www.nal.usda.gov/pgdic/Barley.htm>.

2) Literature assistance has been offered for all species databases. See "Data Acquisition for Species Databases," p. 3.

3) Bean Improvement Cooperative (BIC) Digital Conversion Project. In FY'96, PGDIC undertook the task of digitizing and scanning the entire series of annual reports and conference proceedings from 1957 to the present, and archiving them in the NAL digital collection.

The series was contracted out for a double-key entry method providing 99.9% accuracy. In addition each page was scanned at a preservation quality level to help ensure 100% accuracy of the information for archival purposes.

The materials have now been completely digitized and scanned. The digital materials will be marked up in Standard Generalized Markup Language (SGML), an international standard to help ensure future access to all materials despite technological change. The basic mark-up is nearly complete. The next steps will be to resolve any unidentifiable materials, link the images with all other components in the system, and work on an SGML to Hypertext Markup Language (HTML) filter. Automated indexing with an appropriate search engine will be put in place. One of our final tasks will be the addition of conceptual tagging.

This project has been undertaken with the full cooperation of BIC. Major cooperators include: Dr. Howard Schwartz, President, BIC; Dr. Phil McClean, PI, BeanGenes Database; and a number of researchers via the PGDIC-administered Beantalk listserv.

PGDIC is keeping BIC up to date on the project with fliers and articles. For example, a paper has been submitted for publication in Volume 40 of the BIC *Annual Report* which introduces and explains the project to the research community.^{2,3} PGDIC staff and Dr. John Kane, Coordinator of Electronic Publishing and Archiving at NAL, have been invited to give a presentation for the upcoming biennial conference in November 1997.

NAL has provided considerable resources to this program. Dr. John Kane has identified and modified the Document Type Definitions, Navigator and Style sheets, and much more. An example of this project can be viewed at <http://www.nal.usda.gov/pgdic/Beans/beansgml.htm>.

4) Strawberry Improvement: Past and Future.

PGDIC is assembling an online information product on the history and practice of strawberry improvement, focusing on the work of former USDA-ARS scientist Dr. George Darrow. The resource, a World Wide Web presentation in both SGML and HTML, will comprise both bibliographic and full-text information from historical and current genetics research materials, images from NAL's Special Collections, and links to valuable external sites in education and industry. Our goal is to make older genetics materials accessible, and, using the power of SGML, to provide increased access and retrieval capabilities for current information. From the project's inception, we have actively sought and incorporated the input of strawberry experts. (See Appendix 6 for a list of project advisers).

Progress to date: Significant copyright research and good faith efforts to obtain copyright clearance for reproducing George M. Darrow's monograph, *The Strawberry: History, Breeding and Physiology* have been made. We have scanned the book for Optical Character Recognition (OCR) and are in the process of correcting the text. We are also seeking copyright clearance for the non-USDA photographs and plates in the book. Many photographs of USDA-developed varieties have been scanned as well as some of the historical water color studies from the NAL Special Collections. Permission to post the full text of a USDA Economic Research Service (ERS) publication on the strawberry industry has been received, and the publication has been scanned and corrected. A wide search has been conducted through the WWW to identify useful sites for linkage.

5) Conference Exhibits.

In FY'97, less emphasis will be given to conferences in order to meet our mandated priorities of training and assistance to minor crops. (See Appendix 4 for FY'97 exhibits.)

6) Administrative Program Support

PGDIC has managed the external agreements to support the Oregon Wolf Pack project as well as the NAL database design team, and other related support personnel. FY'96 introduced new management requirements for these agreements requiring significant work on the part of the PGDIC Coordinator to clear the way for the agreements to continue.

7) Resource Development in FY'97: This year, fund-raising efforts have included

- Informal request for printing funds to continue with Phase I training program.
- Proposal to support the continued development of the Strawberry Improvement Project.
- Proposal made to BIC for additional support to continue with the digitizing project.
- Proposal made to Dr. Sally Rockey, Deputy Administrator, CSREES, Competitive Research Grants Administration Management.

8) Collaboration with the Technology Transfer Information Center (TTIC)

Later this year PGDIC and TTIC will decide between 1 of 2 options, with input from Dr. Edward Kaleikau, Division Director, NRICGP, Plants Division. One option would be to try and assess the impact that the research program has had in the field of genome research; the second option would be to look for means to assist in the transfer of technologies developed under the research program to the private sector; following protocols developed by TTIC with other industries.

Future Plans

PGDIC will continue to develop in-depth digital collection of genetic literature spanning many species. With a large collection of genetic literature, we will begin to develop a set of standard conceptual keyword/keyphrase tags to be applied across all species. Once the standard set of tags has been developed and applied, we will conduct tests to determine the full range of SGML capabilities and the necessary indexing and search engine requirements needed to support the highest level of functionality.

We have already begun contacting various organizations and individuals that are connected with potential new species for this project. Some of our contacts include: triticale (Pat McGuire, International Triticale Mapping Initiative); *Arabidopsis*, (Mike Cherry, *Arabidopsis* Information Service); rice, (Susan McCouch, PI, RiceGenes Database, with contacts to Hank Beachum and the Rockefeller Foundation Newsletter and Proceedings) and others as opportunities develop.

We will continue with the database training program and finalize the Phase II on-line tutorial. We will initiate Phase III of the training program, which will focus on the native ACeDB database formats.

Site Linkages:

1) External sites linking to PGDIC WWW-site.

A recent AltaVista search for external links to the PGDIC homepage detected that 27 sites had established links. Given studies that suggest AltaVista may only be indexing 20% of the total WWW, it is reasonable to conclude that there are more. We have consistently submitted our site to the major WWW indexing services, and Dan Cabirac has updated these services with each change in our URL.

2) PGDIC links to external sites.

Link checker software has recently been modified and added to our site and will be used routinely to verify the status of all links from our WWW-site.

Usage Statistics:

PGDIC has kept comprehensive counts on raw numbers of information requests received and materials distributed since 1991. As this method of information was too crude to allow for any informed decisions regarding user needs, Annette Colbert was given the task of developing a database using FileMaker Pro to collect more precise user statistics. Annette and later Ed Donald refined our input, and by FY'95 we were able to analyze the type of information requested, how it was requested, how the query was answered, and the affiliation of the requestor. Early in FY'96 Judy Ruttenberg and Susan McCarthy began to categorize the questions, allowing more informed decisions to be made regarding the development of new information products and services. (See Appendix 1 for a complete breakdown of publications distributed, category of information needs, and the PGDIC user population.)

Electronic statistics are far less reliable at present. Most of the PGDIC materials were maintained on the NAL gopher until just recently. Unfortunately, those statistics are unavailable at present.

Last April NAL inaugurated its WWW-server. One of the first materials that PGDIC began converting into HTML was the *Probe* newsletter. In the first calendar year nearly 6,000 hits had been made to *Probe* alone and activity was increased an astonishing 10-fold in calendar year 1996 to nearly 60,000 accesses! The trend continues with over 7,000 accesses in the first three months of 1997.

The Bean Improvement Cooperative (BIC) test page was first made available in the late summer of 1996. An announcement was sent to BIC researchers in the November mailing of their request for papers, resulting in over 1200 hits to this site.

The 1997 WWW reports covers the period January 1 - March 31 during which time PGDIC was converting more of its gopher resources into HTML materials. This effort is reflected in the statistics by class with many showing first time activity. We hope to have a full report, including gopher statistics, in time for the formal review.

Project Outlook: Susan McCarthy, Coordinator, PGDIC

As the Plant Genome Research Program continues to mature, its needs will change. PGDIC has shown its capability in meeting those changing needs. In the beginning, when outreach was critical, that is where the majority of our effort and resources were directed. Next came the need for user training, which we have undertaken and are continuing to develop. Finally, we come to the need of adding retrospective data to the databases. These materials are crucial to optimize the research investment in the overall program, and NAL and PGDIC are uniquely capable of providing these services. Not only does NAL have the world's largest collection of agricultural literature, and is hence the source of significant historical data; the Library is also committed to providing access to these sources via a digital collection available over the Internet. Finally, PGDIC has established protocols for digitizing the materials and methods for working with each research community to ensure that their individual needs are met.

The one major challenge with the program, as currently designed, is maintaining close communications among the various projects. To improve the efficiency of the program, annual reports from each aspect of the program, with a summary of their accomplishments for the year; their plans for next year; and what their greatest needs are, should be made to all participants.

Communications between PGDIC and the Genome Informatics Group (GIG) can be further improved with more frequent, quarterly meetings in which the database is demonstrated, and the new directions in development are fully explained with an emphasis on how the changes will impact the end-user in accessing the databases, the user interfaces, and the training program. The PGDIC coordinator serves as the ADODR for this cooperative agreement, and in order to fulfill the responsibility of negotiating annual agreements, needs to receive the aforementioned information on a regular basis.

Finally, it is recognized that resources are limited. In FY'96 PGDIC was directed to cease publication of *Probe*, and to redirect efforts into developing training programs. This was accomplished. In FY'97 PGDIC was again asked to redirect programs to increase emphasis on minor crops while sustaining a 38% overall budget cut. Any further redirection of program and/or budget cuts will seriously impact database and user services.

Budget and Personnel:

Budget Narrative:

Table 1 provides an overview of the Plant Genome budget allocations at NAL for FY'94 - FY'97. In FY'94 NAL was an independent agency and charged a 6.5% overhead of \$112,000 (significantly lower than the usual 17% charged). In December 1995, NAL merged with ARS. The funds previously sent to NAL as interagency reimbursable funds became temporary headquarter funds and no longer subject to overhead. The decision was made to reallocate the NAL agency overhead with a slight increase to the Technical Services Division (TSD), and a significant increase to the Information Systems Division (ISD). More or less the same allocations

**Table 2. PGDIC Budget History
Fiscal Years 1994 - 1997**

Budget Category	FY 1994	FY 1995	FY 1996	FY 1997 - Bud	Totals
Federal Salaries	\$158,000.00	\$155,450.00	\$166,057.00	\$174,000.00	\$653,507.00
Travel	\$23,893.35	\$10,827.34	\$6,632.42	\$9,479.00	\$50,832.11
Transport	\$2,960.29	\$2,427.85	\$2,875.00	\$2,400.00	\$10,663.14
Rent	\$20,218.07	\$11,280.90	\$12,815.10	\$4,200.00	\$48,514.07
Printing	\$10,132.70	\$7,986.00	\$2,500.00	\$0.00	\$20,618.70
Other	\$2,379.50	\$9,945.60	\$4,669.00	\$5,500.00	\$22,494.10
Repair	\$420.00	\$1,418.00	\$1,710.80	\$400.00	\$3,948.80
Coop Agmts	\$129,157.54	\$131,194.33	\$132,260.00	\$66,759.00	\$459,370.87
Supplies	\$15,527.54	\$20,117.82	\$12,826.46	\$13,000.00	\$61,471.82
Contracts	\$0.00	\$0.00	\$21,344.88	\$0.00	\$21,344.88
Equipment	\$23,381.37	\$31,390.44	\$9,314.76	\$4,654.00	\$68,740.57
Total	\$386,070.36	\$382,038.28	\$373,005.42	\$280,392.00	

**Table 3. PGDIC Managed ARS Coop Agmts
Funds added to the PGDIC account for outside Cooperators FY 1994-1996**

Cooperator	FY 1994	FY 1995	FY 1996	FY 1997	Totals
H. Goodman	\$50,000.00	\$0.00	\$0.00	\$0.00	\$50,000.00
S. Tanksley	\$60,000.00	\$60,000.00	\$0.00	\$0.00	\$120,000.00
S. McCouch	\$60,195.00	\$50,000.00	\$0.00	\$0.00	\$110,195.00
P. Hayes	\$35,000.00	\$15,000.00	\$0.00	\$0.00	\$50,000.00
T. Blake	\$15,000.00	\$12,000.00	\$0.00	\$0.00	\$27,000.00
CarBank	\$40,000.00	\$0.00	\$0.00	\$0.00	\$40,000.00
J. Costa	\$0.00	\$0.00	\$20,000.00	\$0.00	\$20,000.00
Totals	\$260,195.00	\$137,000.00	\$20,000.00	\$0.00	

were budgeted for FY'96. Finally, significant reallocations of funds were made between the NAL Divisions in FY'97.

In addition to the reimbursable/temporary headquarters funding some additional funds were made available to the Information Systems Division. In FY'94 \$55,000 that had been previously allocated to the Public Services Division (PSD) were transferred to ISD for systems documentation. This money came from a one-time Animal Genome Grant in FY'93. Also, in FY'97, \$83,000 was added to the NAL base funds for the ISD, Plant Genome Program.

Table 2 provides a detailed break-down of the actual operating budget for PGDIC covering FY'94 - FY'97. The amounts listed for FY'97 are budgeted and do not reflect actual expenditures.

Each year from 1994 through 1996 PGDIC distributed funds for the ARS, Office of Plant Genome Research. These funds were used for a variety of purposes including the development of several species specific databases. The funds were added to the PGDIC accounting code and are reflected in Table 3.

In the FY'94 budget the Indirect Costs (overhead to NAL) were also placed in the PGDIC account. Allocations for Federal Salaries and the Indirect Costs were removed by the Administrative Office upon receipt of funds. In the early years of NAL plant genome involvement, the Associate Director for Public Services, as Program Manager, participated heavily in nationwide plant genome activities. These activities included significant travel and staff time, which were supported by some plant genome funds. In later years the involvement of that office declined, and less funding was required. Expenditures in FY'94 and FY'95 were \$10,000 and \$3,000 respectively.

Explanations for expenditures on single purchases or events over \$5,000

In all cases, the purpose for amendments to cooperative agreements was to reimburse the University of Maryland for personnel and other costs related to the Program.

FY'94

Equipment: Two personal computers were requested on a single procurement, each computer was less than \$5,000.

FY'95

Equipment: a projector system was purchased for database demonstrations and a color printer was ordered for the PGDIC Demonstration Center / NAL Imaging Center. This is a shared resource for use throughout NAL and other sources have contributed money for the overall set-up.

FY'96

Other: contracts for scanning and digitizing nearly 5,000 pages of the BIC Annual Reports and Conference Proceedings. Some minimal level SGML mark-up was added to the contract as well.

Personnel paid by Plant Genome Research Program funds

FY'94 - Present

Dr. Susan McCarthy, Coordinator, Plant Genome Data and Information Center

As coordinator, Dr. McCarthy has primary responsibility to shape and manage projects undertaken by the Center ensuring that current objectives are being met. In addition, duties included Managing Editor, *Probe* newsletter; Program Outreach conferences, presentations, articles, reference and referral, and administrative support to the Program Office and the database design team. Additional responsibilities include efforts to develop outside funding to complete the work supporting many of the minor crops.

100% Time (Except for other services rendered to support the needs of NAL.)

Dr. Andrew Kalinski, Molecular Biologist and Information Specialist

Andrew had the lead responsibility in designing and implementing the Phase I training program in FY'94. In addition to these duties, Andrew produced well over 21 print products; the Plant DNA Library Data Resource; and the Mapping Projects Files. These resources were based on user feedback and questions. Andrew fully participated in our outreach activities in representing the Center at many conferences, exhibits, and demonstrations.

100% Time on the project (August 1993 - October 1995)

Barbara Buchanan, Librarian

Barbara has worked with each of the species database curators in meeting their individual needs for literature, data, and funded projects. Barbara had the lead role in representing NAL on the NAL/NLM GenBank scanning project. Additional duties include keeping up-to-date on current copyright law and negotiating copyright clearance agreements. She made a brief presentation on copyright issues to the PIs at a database design meeting. Barbara also maintains a current calendar of events that was published in the *Probe* newsletter and updated monthly on our gopher and WWW sites. Barbara also assists with outreach at conferences, serves as the Center's reference coordinator, and personally handles many reference questions. Barbara is also a co-instructor for the database training program and is responsible for collection development in the area of plant genetics for NAL.

Recently Barbara has begun to update and work on the numerous publications produced by Dr. Kalinski. She is coordinating the CRIS project collaboration and monitors the PGDIC WWW site. She is currently learning HTML to help convert the print-only publications to electronic format.

100% Time (Except for other services rendered to support the needs of NAL.)

Terrance Henrichs, Office Automation Assistant

Terry served as the production manager and designer for the *Probe* newsletter, earning high praise from our readers for appearance and readability of the publication. (See Appendix 3.) She develops the original graphics and design for PGDIC's many other publications. Terry provides significant administrative support in monitoring and processing payments for all specific cooperative agreements and the PGDIC budget, and provides oversight to the students and other office support personnel. Terry's skills have been vital to the outreach program, in solving technical problems at exhibits, answering user questions and representing PGDIC. Terry also serves as PGDIC's advisor on hardware and software solutions; and her recommendations are made following personal product research. Every piece of equipment purchased with Terry's advice has proved its worth over and over again.

Terry is learning SGML and HTML to enhance WWW design for the Center's WWW-site, our WWW-released electronic resources, and our future digital conversion efforts. She will be coordinating the implementation of the on-line Phase II training tutorial, and, with her considerable experience with scanning images, she will also be coordinating the imaging project with Drs. José Costa and Pat Hayes for the Barley Wolf Pack Project.

100% Time (Except for other services rendered to support the needs of NAL.)

Annette Colbert, Graduate Library School Assistant, Univ. of MD

Annette managed the *Probe* mailing list and the production of PGDIC publications. Most of the Center's print publications are produced in-house, which requires personnel to reproduce, assemble, inventory and pack for conferences, etc. Annette also managed the reference and distribution statistics for the Center. While working for PGDIC Annette developed a FileMaker Pro database to gather in-depth information on our reference user group.

50% from September 1994 through May 1995

Sara Ranck, Graduate Assistant, Dept. of Plant Biology, Univ. of MD

Sara worked to develop educational resources with instructions for using gopher and the plant genome databases. In addition, Sara helped represent the Center at several conferences and exhibits, and aided in working on Reference requests. Sara spent a year with us and returned to a teaching assistantship to enhance her experience in preparation for a career in teaching.

50% from August 1994 through August 1995

Jennifer Trozzo, Accountant Clerk

Jennifer's major tasks were to keep the daily accounts for the PGDIC budget; handle travel, training and other routine forms; answer the telephone and address calls appropriately; order supplies; maintain a supply inventory; assist in preparations for the exhibits and conferences (packing and assembling materials). One of Jennifer's main jobs was to handle all the

arrangements for the Center's exhibits, take care of the paperwork, make contact with the conference managers, and so forth. Jennifer left this position for another University of Maryland appointment at the end of September 1994.

100% Time (FY'92 - FY'94)

Edward Donald, Graduate Library School Assistant, Univ. of MD

Ed came on board mid-way through FY'94 to take over all of Annette's assignments in May. While working with Annette and afterwards, Ed continued to refine the FileMaker Pro database. By the end of FY'94 we had a useful database and were able to begin collecting information for FY'95 and beyond. Ed took over Annette's responsibilities in May 1995 and continued until his graduation in December 1996. Ed remained on board to work with a new graduate student part-time for a few months before accepting a full-time job in affiliation with the Univ. of Connecticut and the NLM regional system.

50% from May 1995 through December 1995; part-time January 1996 through March 1, 1996.

Evelyn Jones, Accountant Clerk

Evelyn was hired in 1994 to fill the vacancy left by Jennifer Trozzo. Evelyn has made significant contributions in helping with the training program; assembling the manual; registering class participants; advertising the course schedule; and compiling the results from the course evaluations. Evelyn has also helped to compile the results from the *Probe* readership survey. Currently, Evelyn is working closely with Barbara Buchanan to take over the monthly updating of the Plant Genome Calendar of Events; she is also working closely with Barbara in the searching the CRIS database and assisting in the preparation for making links between CRIS projects and the PGDIC WWW site. Evelyn has also worked on digitizing Dr. Miksche's publication. She also carries the same responsibilities identified with Jennifer Trozzo, as well as producing and distributing requested PGDIC publications.

100% from December 1994 - Present

Daniel Cabirac, Systems Librarian

Dan was first hired in August 1994 to assist the Center with preparing materials for both gopher and WWW. In addition to these duties Dan has helped to coordinate the Bean Improvement Cooperative Project in writing the basic work statements, identifying possible vendors and providing quality review checks. Dan's knowledge of UNIX and his abilities to locate and modify scripts has greatly aided PGDIC in moving our materials to the WWW. Dan is also responsible for helping to set up two listservs for the Center. Dan has considerable knowledge in scanning/imaging and managing images on the Web. Currently Dan is assisting PGDIC and NAL in locating appropriate indexing and search engines for NAL's Digital Collection.

30% from August 1994 through April 1995

40% from April 1995 - April 1996
20% from April 1996 - June 1997

Judy Ruttenberg, Archivist and Historian

Judy began with PGDIC in October 1995 as a Graduate Library School Assistant, graduating in December 1996. Throughout this period Judy served the same functions that Annette Colbert and Edward Donnald served for the Center. Upon graduation, Judy was re-hired to assist the Center by Coordinating the Strawberry Project. She has conducted exhaustive copyright searches for the Darrow book and made numerous contacts for the project. Judy is largely responsible for pulling the group of cooperators together to serve as our advisors on the project. Judy also conducted an initial survey of the Darrow papers currently housed in the NAL Special Collections. She continues to provide assistance to the Center in the production of our publications, reference assistance, managing the FileMaker Pro Statistics Database and helps with preparations for exhibits.

Judy is currently working on scanning the Darrow book and correcting the OCR. She has already completed the scanning and correction of a USDA, ERS publication on strawberry production in the U.S. Judy has conducted extensive WWW searches to identify the best sites for linkage and has greatly aided in developing grant proposals and project summaries to help in the effort to raise funds to complete this project.

50% from October 1995 through December 1996
100% from January 1997 through June 1997

Michael Tims, Graduate Research Assistant, Dept. Plant Biology, Univ. of MD

Michael began work with the Center in August 1996. His main responsibility is to coordinate the communications between PGDIC and the bean research community by serving as moderator of the Beantalk listserv. One of the main roles for the Beantalk listserv is to help identify with the community the key concepts that should be tagged for conceptual retrieval of information. This process will continue at least through the end of June. Michael is also working in SGML to finalize the generalized tagging, which will help to build his experience and knowledge base in SGML to work on the conceptual keyword/keyphrase tagging.

Michael has also co-authored a paper describing the project for the bean community and is currently working with Dr. Howard Schwartz to identify additional funding sources to continue the work on the project past the June 30 end of funding deadline.

50% from August 1996 through June 1997

Shilpa Shenvi, Bioinformaticist-in-training

Shilpa began as a volunteer with the Center in mid-FY'96, and she worked 3 days per week during this time. Shilpa was exploring several career options and PGDIC provided her with a

perfect testing ground. When she started she was unsure whether to go in the direction of science communications or bioinformatics. While working with us at the Center she is learning PERL scripting and taking additional classes in C++ programming. She has provided us with significant help in the Bean Improvement Cooperative Project. Starting March 31 she began working part-time for PGDIC and for Dr. John Kane, Coordinator of Electronic Publishing and Archiving at NAL.

30% from April 1997 through June 1997

Current (April through June) FY'97 Staffing List:

Susan McCarthy	100%
Barbara Buchanan	100%
Terrance Henrichs	100%
Evelyn Jones	100%
Judy Ruttenberg	100%*
Michael Tims	50%*
Shilpa Shenvi	30%*
Dan Cabirac	20%**

* Current funding lasts only through June 30, 1997

** Following June 30, Dan may return to 40%

References:

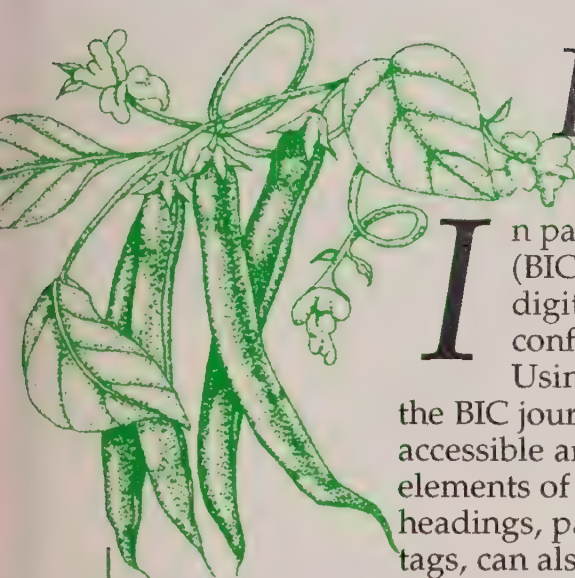
- 1) "Plant Genome Activities at the National Agricultural Library, Roll-out Plan - FY 1991." DRAFT, Revised 10/15/90. (Full text can be found in Section 1, Reference 2.)
- 2) "Partnership" PGDIC informational flier.
- 3) Tims, M., McCarthy, S. (1997) Bean Improvement Cooperative Digital Conversion Project. *BIC Vol 40* (submitted).

Appendices:

- 1) Reference and Distribution Statistics
- 2) Training Class Evaluations
- 3) Probe Readership Survey Analysis
- 4) Exhibits Table
- 5) Letters from Collaborators
- 6) List of Strawberry Project Advisors
- 7) WWW Statistics by Calendar Year
- 8) CVs from PGDIC Staff

Full Text References

- 1) BIC Partnership Flier sent to all members in November 1996.
- 2) Article for Volume 40 of the BIC *Annual Report*.



PARTNERSHIP

In partnership with the Bean Improvement Cooperative (BIC), the National Agricultural Library (NAL) has digitized text from the past 39 annual BIC reports, 4 conference proceedings, and supplemental indexes.

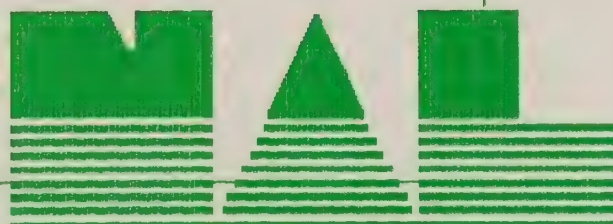
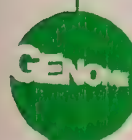
Using Standardized General Markup Language (SGML), the BIC journals will become a World Wide Web resource, easily accessible and readily searchable. SGML allows the structural elements of a document to be identified (for example: chapter headings, paragraphs, sections, etc...). Element names, called tags, can also be used to identify keywords or keyphrases in the document that represent important ideas to the Bean researcher. Since a range of people, from graduate students to established researchers will be using the BIC journals as a database, different levels of tag specificity are needed. The tagging system is organized from general to specific. For example, within the broad area of pathogens are the narrower topics of causal agents and pathology. Using SGML constructed documents, a keyword search can return the relevant passages from each article combined into one final product, saving the researcher the time and work of reading each article in its entirety.

A document without specific keyword tags can still be used in a word search. For example, if searching the term "pods", a list of all documents containing that word will be returned. Clicking on one of these titles will retrieve the corresponding document, with the specified word highlighted (in this case, "pods"). Tagging, however, provides more analytical uses such as creating lists (pathogens/subcategories) and researching relationships between ideas that are not evident in the text (ie genes/disease resistance). Phil McClean (mcclean@beangenes.ews.ndsu.nadak.edu) has provided a detailed list of keywords, which is undergoing review by members of the Bean community (see beantalk@nal.usda.gov). Starting mid-November, Dan Cabirac and Michael Tims will use the keyword list to develop a tagging process, some of which will be automated.

At this point, only one document at a time can be searched. Once we have a site search engine, all of the BIC journals will be simultaneously searchable. In addition, most browsers used to view WWW documents are HTML specific. Access to an SGML browser, Panorama for Windows by SoftSquad, will be found at the Bean Improvement Cooperative homepage (<http://www.nal.usda.gov/pgdic/Beans/beanssgml.htm>).

Although we aim to have a finished product by June 30, 1997, it may take a follow up to create a journal database tagged as extensively as we would like. At your next Annual Conference, in Annapolis, Maryland, in the fall of 1997, we plan to deliver a formal presentation with hands on demonstrations of your BIC journal in electronic form. Look for another update in the 1996 Annual Report.

If you have questions, please contact Michael Tims (e-mail: mct@wam.umd.edu, or phone (301) 504-6613).



Bean Improvement Cooperative Digital Conversion Project.

Michael Tims, University of Maryland and Susan McCarthy, USDA, ARS,
National Agricultural Library

Introduction

In an effort to meet current and future user needs, the National Agricultural Library (NAL) announced a new collection policy which encouraged the collection of digital materials over paper and the intention to provide digital access to legacy materials through conversion projects conducted in partnership with users through their representative professional organizations. It is the intention of the National Agricultural Library to preserve and provide the widest possible access to the treasures of its world-class collection. We believe that providing digital access best meets these goals.

Libraries have traditionally provided society with the means to preserve knowledge. In the past preservation was primarily directed to housing paper copies for materials of factual, cultural, and governmental importance. Paper is inexpensive and can be read by any knowledgeable individual, it is not dependent on any particular hardware or software.

Today, if we intend to preserve information in a digital format, we must also ensure that future generations will continue to have access despite technological changes in both hardware and software. At the simplest level this type of preservation would require the simultaneous preservation of hardware, operating systems, specialized software along with replacement parts, maintenance manuals, and so forth. Clearly this simple solution is very expensive and still cannot guarantee long-term access.

The long-term solution to the preservation dilemma is to collect the digital information in a universally accepted international standard format. In this way, as technology changes, the basic information would remain accessible, independent of specialized hardware or software.

The international standard format selected by the National Agricultural Library for its digital collection is a basic ASCII text marked up in Standard Generalized Mark-Up Language (SGML). NAL has selected the international standard ISO 8879 (formerly AAP, created for articles and books). This standard provides a meta-data language for creating sets of generic markup structures, allowing the database/information user to change the appearance of the information without having to rewrite the markup. This is possible because SGML identifies the logical elements of the document structure (i.e. chapter headings, paragraphs, sections) separate from the document content (text, tags, etc.) and other elements called entities such as images, graphs, and inter/intra document or site links.

BIC -- NAL Partnership

NAL in cooperation with the Bean Improvement Cooperative (BIC) is working to convert the legacy documents of the Cooperative to a digital format. BIC has published annual reports going back to 1957, in all there are 39 Volumes, additionally the project is converting the 4 Conference Proceedings and indexes. This constitutes nearly 5,000 pages of text.

Each partner shares significant benefits from this program. This project is the "kick-off" of the NAL digital collection. The project provides NAL with the opportunity to experiment building an SGML based collection. The collection itself is significant as a source of unique information not readily available elsewhere. Equally important to NAL for the success of the project is the availability of an instant and active user group to test the product. This is a unusual opportunity for the Library (preservers, defenders, and providers of information) to directly interact with its user group to develop a product that best meets the user's needs.

The Bean Improvement Cooperative, benefits in this partnership through preservation and easy access to its information for the membership as well as providing greater access globally. In addition, continuation of the project in the future may help in standardizing the report format, and much more. Feel free let your mind explore other opportunities.

The documents have been re-keyed using a double entry method to achieve 99.9% accuracy. Additionally, each page has been scanned and will be available for review, in an effort to reach the highest level of accuracy possible. After completion of the ASCII conversion the documents are marked-up in SGML. Linkages will be created between the image files and the text files. Full access to this base level mark-up will be completed by June 30, 1997. As time and resources permit conceptual tagging will be undertaken. NAL is fortunate that the BIC is taking an active role in identifying the key concepts for this tagging.

Come and share your thoughts with us by visiting our BIC homepage, an example and address information can be found at the end of this article.

How SGML Works

The meta-data language of SGML (SGML ISO 8879) is separated into several component files, these include: Document Type Definition; Style Sheet; Navigator; and Declaration, which ties the various components together through the use of element names identified with specific tags.

The selected Document Type Definition (DTD) is also a standard ISO 12083. It actually defines the relationship between different elements and defines the rules for element names (tags---chapter headings, paragraphs, sections). What ties the two standards together for the specific document is the Declaration. The Declaration activates desired SGML features defined in the DTD ISO 12083 and then modifies the default settings (for example, the default number of characters in a tag name is 8, the Declaration can change the default setting to 40 or any other number needed for the specific application).

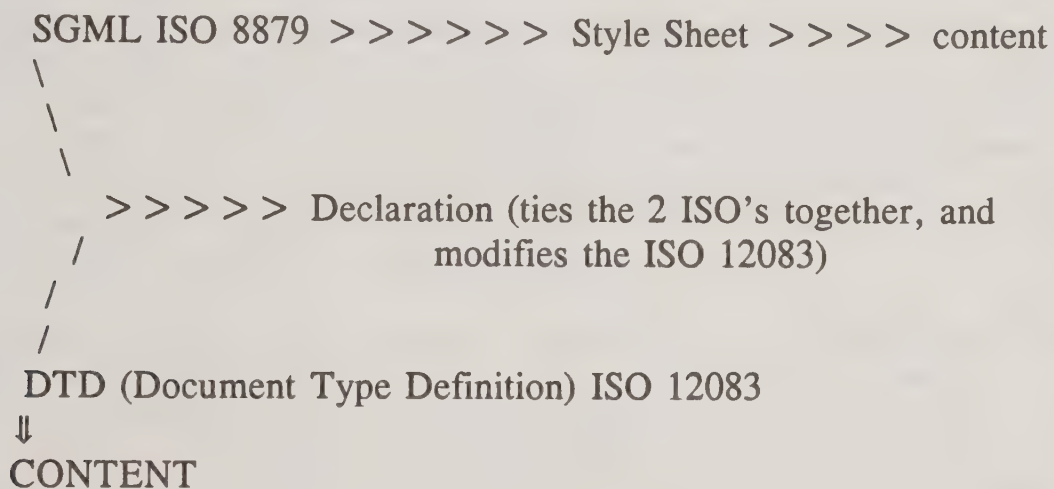
A style sheet controls the appearance of the document. Multiple style sheets can be created for each document allowing different views or selected elements to be displayed while others are not.

Another key benefit to SGML is that a document can now be "parsed"--- the rules defined in the standard can be checked in each of the other elements. The content tags can be checked against the DTD, which in turn can be used to cross check the document for compliance with the ISO 12083 standard DTD, as modified by the Declaration.

As a rule of thumb, if a generic markup structure is not based on a DTD and is not checked by a parser, it's not SGML. To visualize the relationship between the structural features in an SGML document look at the simplified model below:

FIGURE 1

Simplified model of an SGML Document.



SGML Benefits

SGML can provide information consumers with new management tools not currently available. In the near future it should be possible for a user to search either within a single document or across a wide range of documents for specific concepts. Since SGML has independently codified the document structure separate from its content, search results can then be "resynthesized" into a new document containing only those elements from each article relevant to the user's query, yet retaining the citation information for each source material collated into the output document. This will save the user time as a means to quickly identify the most relevant articles to pursue for full text review.

The "resynthesized" or new document is possible through the use of elements called tags. Tags can be used to identify keywords or keyphrases representing important concepts to the research community. Beyond the immediate research community other information consumers include graduate students, educators, journalists, etc. who will be using the

information from your work at different levels. This necessitates a graduation in tag specificity. The tagging system that we intend to adopt will be organized from general to specific concepts.

For example the general area of pathogens can include more specific topics of causal agents and pathology. SGML documents, without specific keyword tags can still be used in a word search. A simple word search for the term "pods" will return a list of all documents containing that word. Clicking on one of the titles will retrieve the corresponding document, with the specified word highlighted (in this case pods). Tagging however, provides more analytical uses, such as creating lists (pathogens and/or sub categories) and researching relationships between ideas that are not evident in the text (genes / disease resistance). At this point, only one document at a time can be searched using the Panorama browser. Once NAL has selected a site-search engine, all of the BIC journals will become available for simultaneous searching.

Viewing SGML and BIC Documents

Neither Netscape nor MSN's Explorer can view SGML documents, since both www browsers are specific for viewing HTML documents. Only one web is currently available to view SGML documents. The beta version of SoftQuad's Panorama for Windows can be downloaded without charge. You can access this browser from the Bean Improvement Cooperative's homepage (<http://www.nal.usda.gov/pgdic/Beans/beanssgml.htm>). The beta version allows you to view documents online but does not allow for downloading or printing; a commercial version of the browser is available with these features.

In order to search an SGML document currently available, point your www browser to the BIC homepage (address given above), from this page download the beta version of Panorama. Set up is self explanatory. Restart your computer, and return to the BIC homepage. Open the article "Effects of Different Storage Times on Cooking Time...". You will see a series of screens opening up as Panorama pulls together the DTD, Declaration, Style Sheet, etc. Go to the magnifying glass icon (the one without an arrow), and type in your search term(s), see the example below. If you want to search for a specifically tagged keyword, you must use the following format: `<keyword type= ###>`. This format allows you to find a word(s) that are wrapped by that keyword tag. If it is a simple word search, type in the word. Some Boolean searches are available in Panorama (see below). Once the NAL site-search engine has been selected we anticipate having the flexibility to add any options needed to meet our users' needs.

Sample Exercises

When you open up Panorama make sure that you open the OPTIONS menu and turn on SHOW STATUS BAR and OCCURRENCE DENSITY DISPLAY.

Example 1: Boolean Searching.....

Open the article, "Effects of Different Storage Times on Cooking Time..." try following the search strings (Hint: turn on SHOW TAGS under OPTIONS, if you have any problems):

Try searching: (cooking time) in <keyword type=selection>
(conclusion) in <title>
(germination) in <section>
(germination in <section>) or (Viera in <section>)

Example 2: Searching for a specific word inside an element tag.....

Try searching: <keyword type=selection> cont (breeding
population)
<keyword type=selection> cont (slow cooking
genotype)

Example 3: Searching for tagged element containing a specific word.....

Try searching:
(<p> cont <keyword type=selection>) and (<p> cont will)

Example 4: Search for a paragraph containing both the tagged element and a specific word.....

Make up your own example.

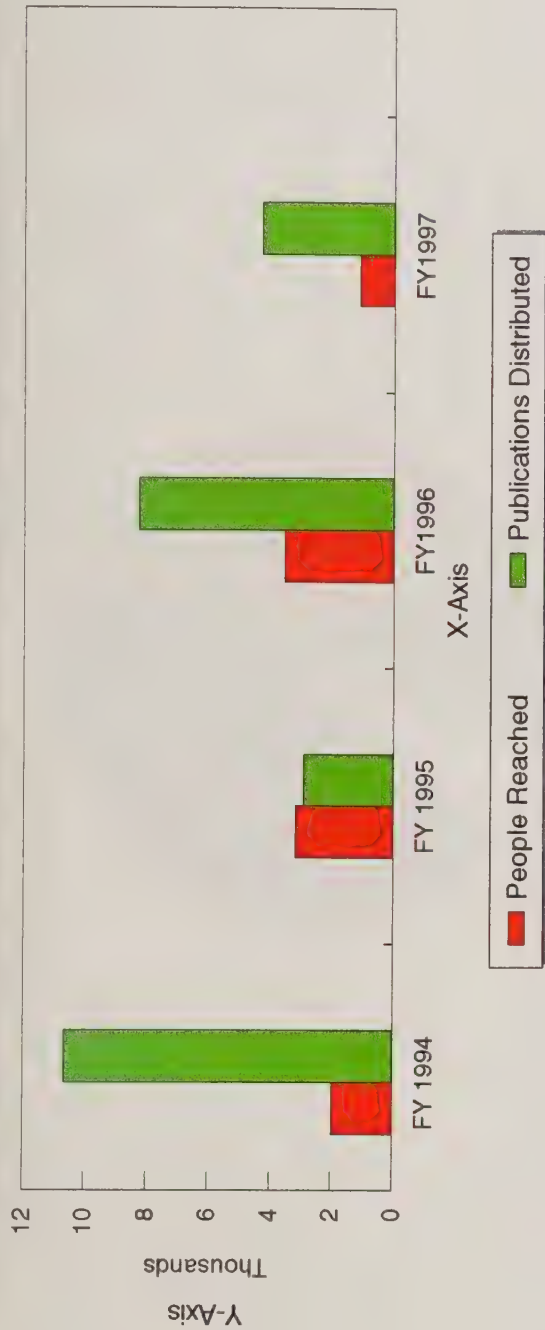
Complex Boolean Searching.....

One final note: if you search for text that is also a tagged element (keyword) in a context search (using 'in', 'and', 'cont', 'or'), surround the text with double quotations marks.

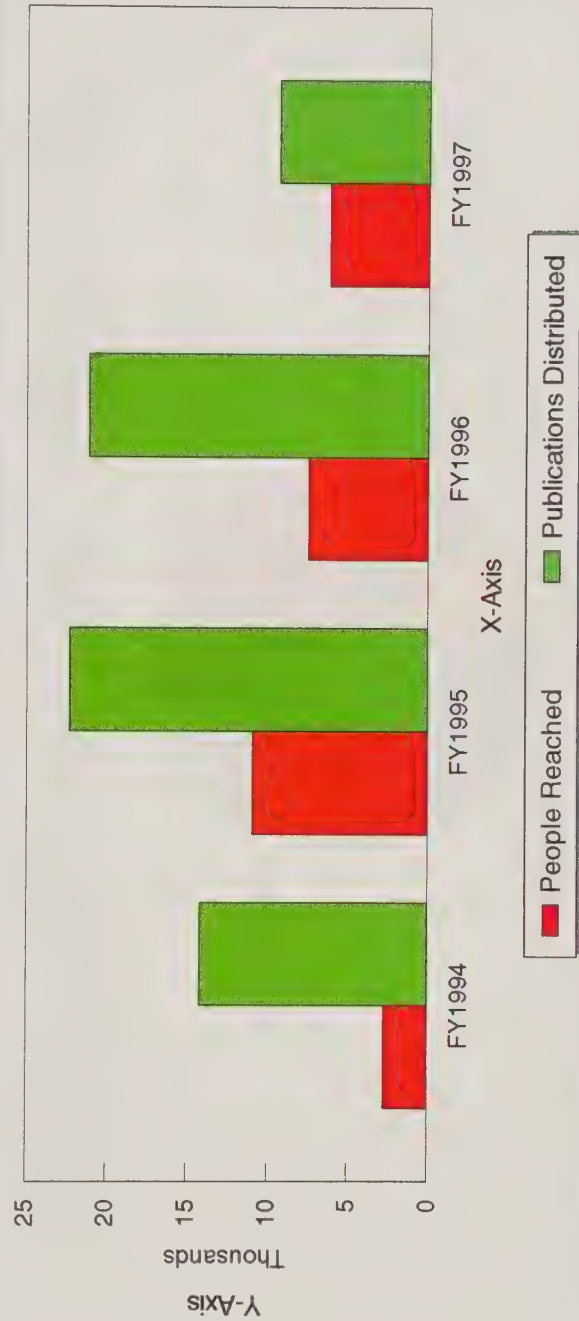
Appendix 1. Reference and Distribution Statistics

- 1) PGDIC Publications distributed FY 1994 - 1997
- 2) PGDIC Reference Queries by Category and User Affiliation
 - a) FY 1995
 - b) FY 1996
 - c) FY 1997

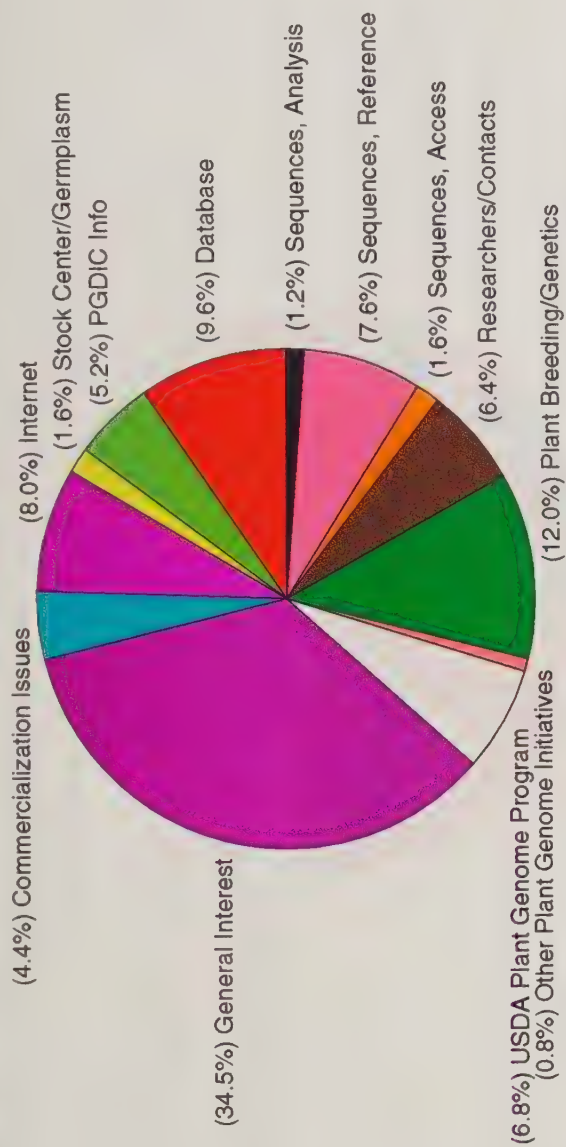
PGDIC Publications Distributed, Conferences 1994 - 1997



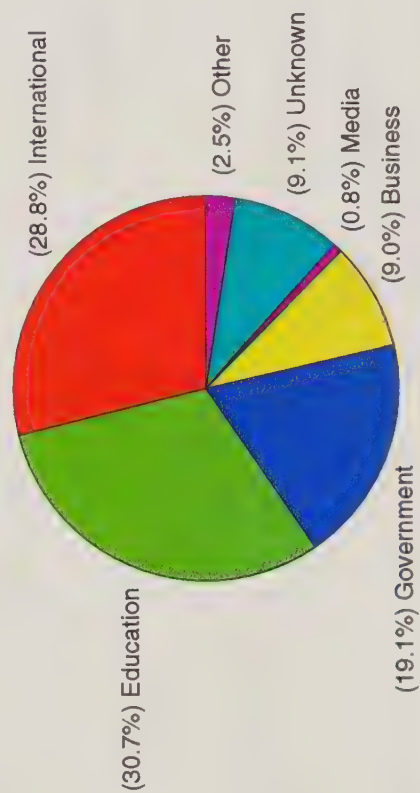
PGDIC Publications Distributed, Total 1994 - 1997



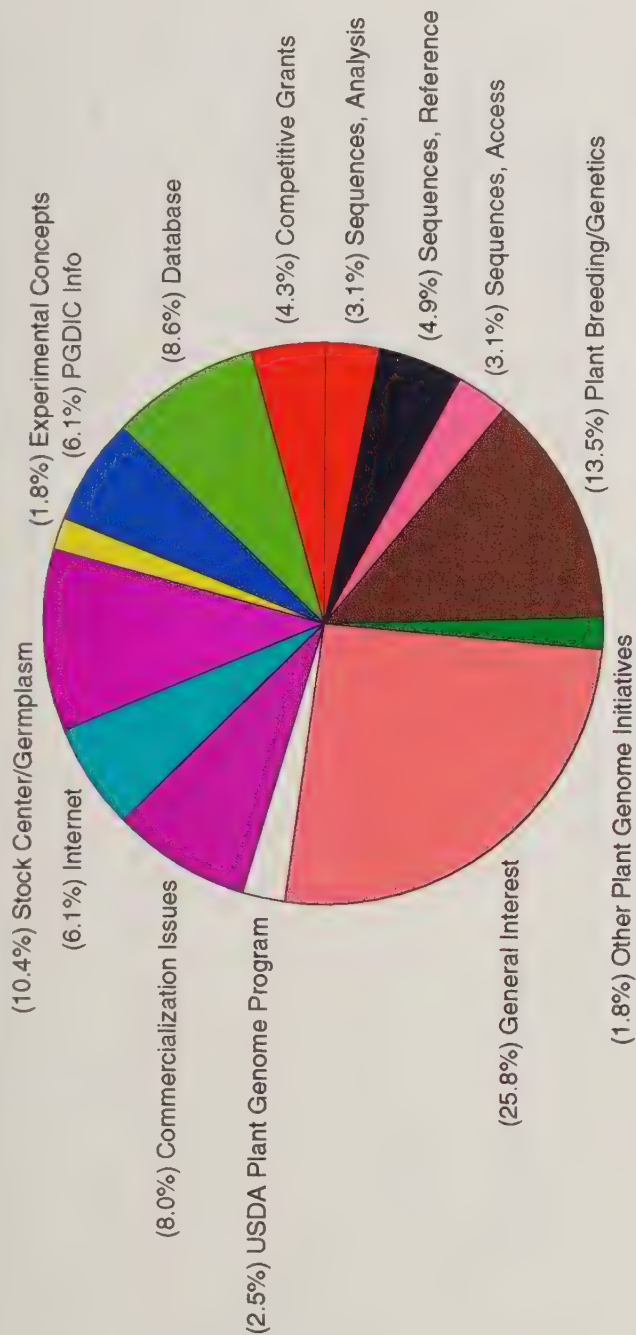
PGDIC Reference Queries By Category FY 1995



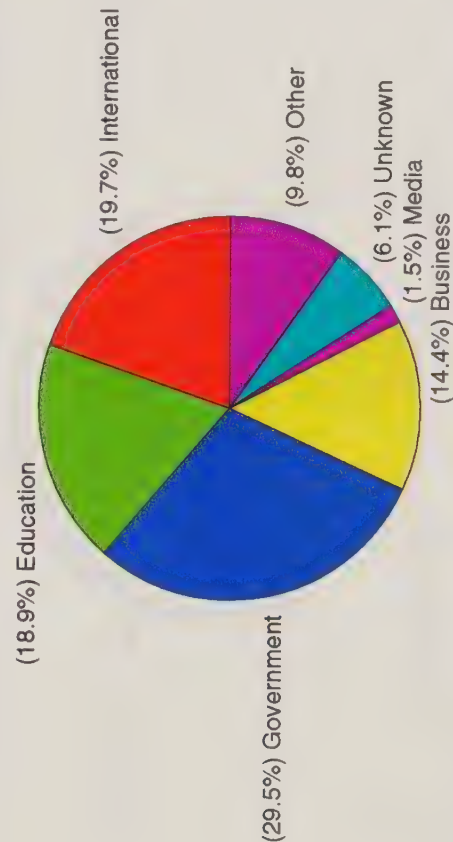
Plant Genome Reference Users By Affiliation 1995



PGDIC Reference Queries By Category FY 1996

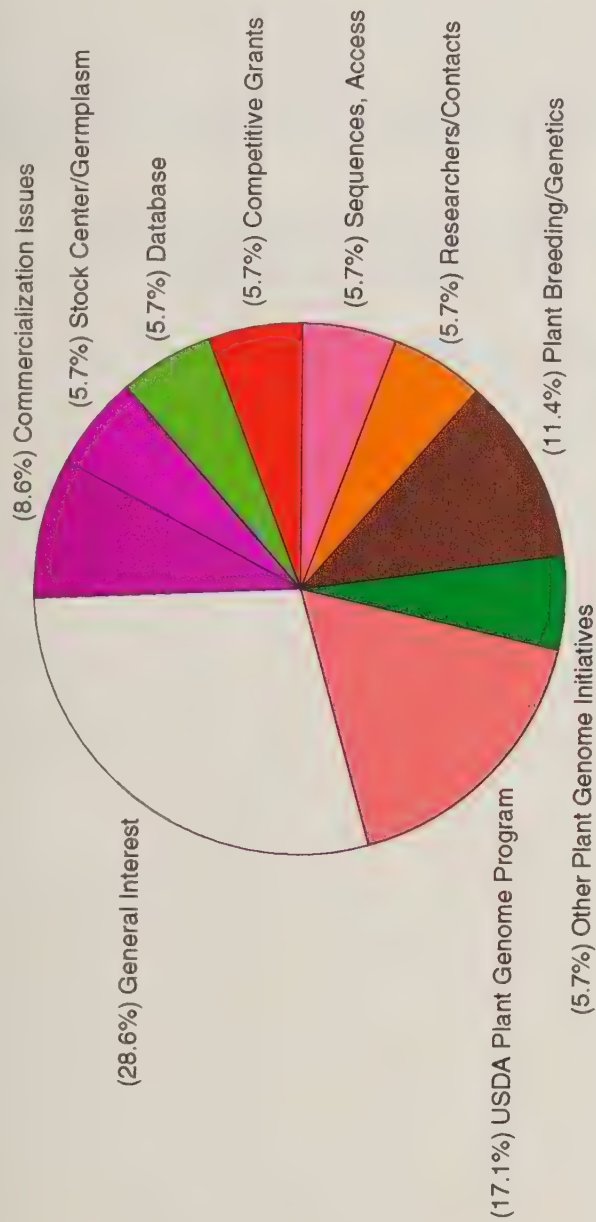


Plant Genome Reference Users By Affiliation 1996

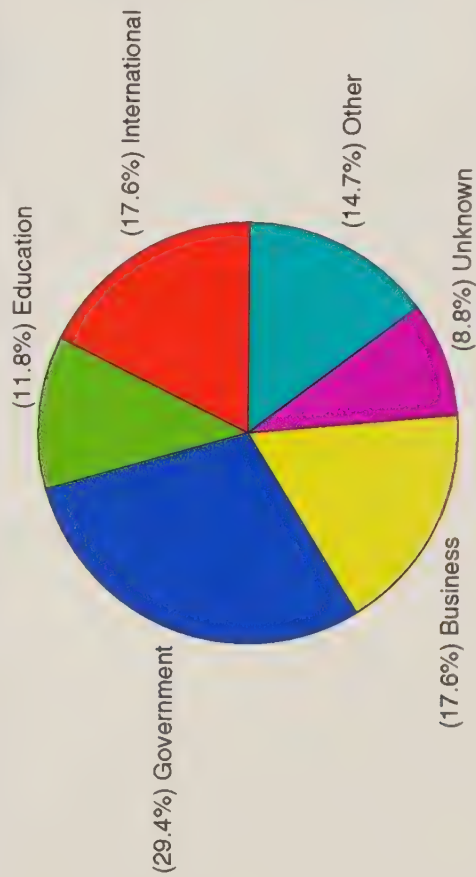




PGDIC Reference Queries By Category FY 1997



Plant Genome Reference Users By Affiliation 1997





Appendix 2. Training Class Evaluations

- 1) Evaluation Summary of Phase I Training Program
June 1995 - December 1996
- 2) Copy of the Blank Evaluation Form

Evaluation Summary of Molecular Biology E-mail Servers Training Program

June 1995 - December 1996

I. Training Content

The following subject areas were rated on a scale of 1-7 for understanding of the subject both before and after the training (where 1=very clear and 7=not clear).

1. Information about molecular biology e-mail servers, their use and usefulness to scientists.

Before	5.01	After	2.32
--------	------	-------	------

2. Selection and usefulness of supporting materials. Usefulness of other "Help" documents.

Before	5.15	After	2.44
--------	------	-------	------

3. Information about AGIS WAISmail Server including the help document, selected examples of composed messages and exercises.

Before	5.83	After	2.51
--------	------	-------	------

4. Information about RETRIEVE Server including the help document, selected examples of composed messages and exercises.

Before	5.77	After	2.25
--------	------	-------	------

5. Information about BLAST Server including the help document, selected examples of composed messages and exercises.

Before	5.62	After	2.71
--------	------	-------	------

II. Instructional materials

The following categories were rated on a scale of 1-7 for usefulness (where 1=very much and 7=not at all).

- | | |
|-----------------|------|
| 1. Manual | 2.20 |
| 2. Presentation | 2.38 |

III. Overall evaluation

The following category was rated on a scale of 1-7 for meeting expectations of attendee (where 1=very much and 7=not at all).

- | | |
|---|------|
| 1. To what extent did this training program meet your expectations? | 2.26 |
|---|------|

2. Length of training session?

Too long	2
Too short	10
Appropriate	56

Other Comments (a selection)

Overall very helpful class. I did not know this was available through e-mail. I look forward to future classes dealing with WWW and Internet.

Please plan for further workshops like this to help us acquire these skills, update our knowledge.

This is the best training class I have taken at BARC in the almost years I have been working here! Thank you - the course was well prepared. The manual is going to be a great resource.

Continue with training sessions to keep us current/updated

Excellent mix of lecture/demo & exercises on one's own.

Susan explained things very well and was very energetic. The computer display on the large screen helped.

An excellent use of tax money.

Molecular Biology E-mail Servers Training Program

EVALUATION

Date: _____

Location: _____

To help us improve future training programs, please respond to the following questions or statements. This evaluation will help us to judge how well the training met your needs.

I. Training Content

For the following subject matter areas, circle the appropriate number that indicates your understanding of the subject BEFORE the course; then indicate your understanding of the subject AFTER the course. The subject matters correspond to the teaching units of the program and are arranged in order in which they were presented.

1. Information about molecular biology e-mail servers, their use and usefulness to scientists.

not clear 1 2 3 4 5 very clear (BEFORE)

not clear 1 2 3 4 5 very clear (AFTER)

2. Selection and usefulness of supporting materials. Usefulness of other "Help" documents.

not clear 1 2 3 4 5 very clear (BEFORE)

not clear 1 2 3 4 5 very clear (AFTER)

3. Information about AGIS WAISmail Server including the help document, selected examples of composed messages and exercises.

not clear 1 2 3 4 5 very clear (BEFORE)

not clear 1 2 3 4 5 very clear (AFTER)

4. Information about RETRIEVE Server including the help document, selected examples of composed messages and exercises.

not clear 1 2 3 4 5 very clear (BEFORE)

not clear 1 2 3 4 5 very clear (AFTER)

5. Information about BLAST Server including the help document, selected examples of composed messages and exercises.

not clear 1 2 3 4 5 very clear (BEFORE)

not clear 1 2 3 4 5 very clear (AFTER)

II. Instructional materials

1. Manual

not at all 1 2 3 4 5 very much

2. Presentation

not at all 1 2 3 4 5 very much

III. Overall evaluation

1. To what extent did this training program meet your expectations?

not at all 1 2 3 4 5 very much

2. Length of training session?

too long, too short, appropriate

How can we improve this training course?

Other Comments:

Appendix 3. *Probe* Readership Survey Analysis

- 1) Evaluation Summary of the *Probe* Readership Survey
- 2) Copy of the Blank Survey

Summary of Probe Readership Survey
Conducted October 1995

SURVEY TOTALS

as of 03/31/97

TOTAL NUMBER OF SURVEY RESPONSES 108

HOW WOULD YOU CLASSIFY YOUR PROFESSIONAL OCCUPATION?

SCIENTIST	97
ADMINISTRATOR	2
INFORMATION SPECIALIST	2
JOURNALIST/SCIENCE WRITER	3
MARKETING/SALES	0
EDUCATOR	7
OTHER	2
<hr/>	
TOTAL	113

DO YOU HAVE ACCESS TO THE INTERNET?

YES	89
NO	16

WHAT TYPE OF ACCESS DO YOU HAVE OR NEED?

E-MAIL - YES, A USER	85
E-MAIL - YES, NOT A USER	10
E-MAIL - NO, WANT IT	5
E-MAIL - NO	3

GOPHER - YES, A USER	64
GOPHER - YES, NOT A USER	16
GOPHER - NO, WANT IT	15
GOPHER - NO	3

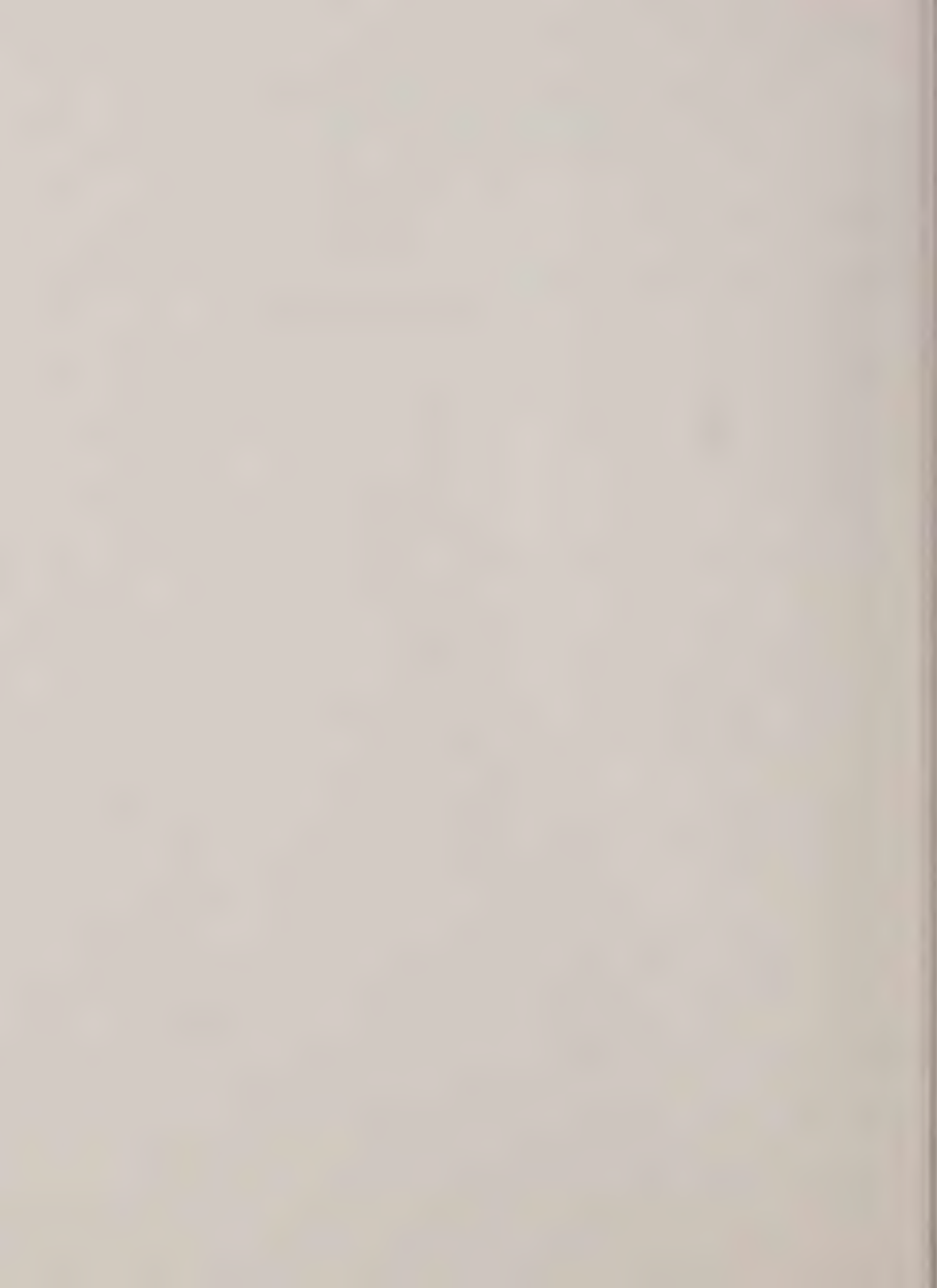
WWW - YES, A USER	59
WWW - YES, NOT A USER	12
WWW - NO, WANT IT	14
WWW - NO	2

WHAT PLATFORM DO YOU USE?

UNIX	20
IBM-COMPATIBLE	77
MACINTOSH	36

HAVE YOU VIEWED THE PLANT GENOME DATABASE(S)?

YES	46
NO	57



**IF YES, HAVE YOU FOUND INFORMATION IN THE PLANT GENOME
DATABASE(S)**

YES	44
NO	3

IF NO, WHY NOT?

Access Problems	14
No Time	4
No Current Need	9
Training Needs	4
Other	7

HOW WOULD YOU PREFER TO RECEIVE PROBE?

ELECTRONICALLY	14
PAPER HARD-COPY	62
BOTH FORMATS	29

HOW DO YOU USE THE INFORMATION IN PROBE?

LEARN ABOUT NEW EXPERIMENTAL CONCEPTS	79
APPLY THE INFORMATION AT MY JOB	48
LEARN ABOUT ISSUES IMPORTANT TO MY FIELD	88
SHARE THE INFORMATION WITH OTHERS	42

HOW MANY?

5, 2, 4, 4, in class, 10, 5, 8, 10, 5, 6, 3, 6-8,
20, 4-5, 10-60, 3, 3, 5-6, 3, 3, 20, 10, 5, 3, 8,
5, 10, 6, 4-6, friends/teachers/lab mates, 3

USE THE INFORMATION IN ARTICLES, GRANT PROPOSALS, CLASSROOM, ETC.	38
INVESTIGATE ADDITIONAL DETAILS	26
FILE IT FOR FUTURE REFERENCE	60
DO NOT USE THE INFORMATION	1

PLEASE RATE PROBE ON EACH OF THE FOLLOWING ATTRIBUTES

ATTRIBUTE

**EXCELLENT/
VERY GOOD**

OVERALL OPINION	85.0%
CONTENT	78.8%
WRITING STYLE	76.2%
EASE OF READING	86.8%
APPEARANCE	73.6%

HOW OFTEN DO YOU FIND INFORMATION IN PROBE THAT YOU HAVE NOT SEEN BEFORE?

ALWAYS	17
FREQUENTLY	61
OCCASIONALLY	27
RARELY	0

PLEASE RATE THE PROBE SECTION OR TOPIC AREAS LISTED (on a scale of 1-5, where 1=not at all and 5=extremely)

TOPIC	RELEVANCE/ USEFULNESS
Competitive Grants Program	3.42
Database updates and reports	3.81
Experimental concepts	3.62
Stock center and germplasm	3.58
Calendar of events	3.72
Internet resources	3.96
Other genome programs	3.55
Commercialization issues	3.27
Introducing program personnel	3.11
General interest articles	3.76

Survey of *Probe* Readers

How would you classify your professional occupation?

- | | |
|---|--|
| <input type="checkbox"/> scientist | <input type="checkbox"/> administrator |
| <input type="checkbox"/> information specialist | <input type="checkbox"/> journalist / science writer |
| <input type="checkbox"/> marketing / sales | <input type="checkbox"/> educator |
| <input type="checkbox"/> other _____ | |

Please, describe your specific position: _____

Do you have access to the Internet? Yes ☐ No ☐

What type of access do you have or need? Please check all that apply.

	Yes, a user	Yes, not a user	No, want it	No
E-mail	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gopher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
WWW	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What platform do you use? Please check all that apply.

UNIX ☐ IBM-Compatible ☐ Macintosh ☐

Have you viewed the Plant Genome Database(s)? Yes ☐ No ☐

If yes, have you found information in the Plant Genome Database(s)?

Yes ☐ No ☐

If no, why not (ie, do not know how to access the database(s)) _____

How would you prefer to receive *Probe*?

Electronically ☐ Paper hard-copy ☐ Both formats ☐

How do you use the information in *Probe*? Please check all that apply.

- ☐ Learn about new experimental concepts.
- ☐ Apply the information at my job.
- ☐ Learn about issues important to my field.
- ☐ Share the information with others. How many? _____
- ☐ Use the information in articles, grant proposals, classroom, etc.
- ☐ Investigate additional details.
- ☐ File it for future reference.
- ☐ Do not use the information.

Please rate *Probe* on each of the following attributes:

	Excellent	Very Good	Good	Fair	Poor
Overall opinion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Content	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Writing style	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ease of reading	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How often do you find Information in *Probe* that you have not seen before?

always [] frequently [] occasionally [] rarely []

Please rate the *Probe* section or topic areas listed below for their relevance, usefulness, and thoroughness of coverage, according to the following scale:

1 = extremely 2 = very 3 = somewhat 4 = slightly 5 = not at all

Section	Relevance	Usefulness	Thoroughness
1. Competitive Grants Program	[]	[]	[]
2. Database updates and reports	[]	[]	[]
3. Experimental concepts	[]	[]	[]
4. Stock center and germplasm	[]	[]	[]
5. Calendar of events	[]	[]	[]
6. Internet resources	[]	[]	[]
7. Other genome programs	[]	[]	[]
8. Commercialization issues	[]	[]	[]
9. Introducing program personnel	[]	[]	[]
10. General Interest articles	[]	[]	[]

Which of the above listed topics would you like to see receive more coverage? Please check all that apply.

1 [] 2 [] 3 [] 4 [] 5 [] 6 [] 7 [] 8 [] 9 [] 10 []

How could the sections above be improved to better suit your needs? Please, indicate section number to which recommendation(s) refer. _____

Do you have an idea for an article? Topic: _____

We estimate that it will take you between 20-30 minutes to complete this survey. Send comments regarding this burden to Department of Agriculture, Clearance Officer, OIRM, AG BOX 7630, Washington, DC 20250-7630. Thanks in advance for your help. Please fold, tape, and mail (or fax) completed survey by October 15, 1995 to: PDGIC Customer Survey, USDA, ARS, National Agricultural Library, 4th Floor, 10301 Baltimore Blvd., Beltsville, MD 20705-2351. FAX (301) 504-7098

Optional:

Name: _____

TEL: _____

Address: _____

FAX: _____

E-mail: _____

Appendix 4. Exhibits Table

List of PGDIC Exhibit and Conference Schedule

1994	1995	1996	1997
U.S. Agricultural Info Network			
American Society of Agronomy	American Society of Agronomy	American Society of Agronomy	American Society of Agronomy
American Seed Trade Association			
Plant Genome II	Plant Genome III	Plant Genome IV	Plant and Animal Genome V
Cloning Plant Genes Known Only by Phenotype	7th National Ag Biotech Council, "Genes for the Future, Discovery, Ownership, Access		Plant Biopesticides and Transgenic Plants
Gatlinberg Symposium			
International Society of Plant Molecular Biology			No funds
Biennial Conference on Molecular & Cellular Biology Soybean			
Mid-Atlantic Plant Molecular Biology	Mid-Atlantic Plant Molecular Biology	Mid-Atlantic Plant Molecular Biology	Mid-Atlantic Plant Molecular Biology
American Society of Plant Physiologists	American Society of Plant Physiologists	American Society of Plant Physiologists	Possibly not: due to reduced funding
Celebration of America's Bounty	Celebration of America's Bounty	Celebration of America's Bounty	Possibly not: due to reduced funding
		FASEB	
Maize Genetics Conference			

Appendix 5. Letters from Collaborators

- 1) References from species database curators.
 - a) David Grant, SoyBase
 - b) Edyth Paul, RiceGenes
 - c) David Flanders, AtDB
- 2) References from the Multinational Coordinated *Arabidopsis* Genome Research Project
 - a) James Tavares, Dept. Of Energy
 - b) Machi Dilworth, National Science Foundation
- 3) Reference for the BIC Digitizing Project
- 4) Reference from NLM for the GenBank Scanning Project



Date: Thu, 3 Apr 1997 13:54:38 -0600 (CST)
From: David Grant <dgrant@iastate.edu>
To: Barbara Buchanan <bbuchana@nal.usda.gov>
Cc: mimsande@iastate.edu
Subject: Support Paragraph Requested

Literature searches performed by the Plant Genome Data and Information Center have been an important part of the SoyBase project since its beginning. At the time when SoyBase was first being set up, the PGDIC staff provided us with a large number (in excess of 20,000) of records dealing with soybean. We would have been unable to collect these ourselves.

As the database matured and the important types of information that it needed to contain were identified, the literature searches have become even more valuable to us. Barbara Buchanan has tailored them to our specific needs by eliminating records dealing with animal feeding or food processing and other subjects that are not relevant to SoyBase. We get Agricola and Biosis records based on our search criteria in a timely manner and on a regular basis, and special requests to provide the accession numbers for papers we have identified ourselves are always handled promptly.

Barbara has also expanded the scope of her searches to include references covering enzymes and metabolism in other higher plants. This is important to us in that it enables us to add the actual data to our metabolism section, as well as the references. Because SoyBase has a very small staff, the literature searches are invaluable to us as a mechanism for keeping our database current.

Several years ago we used the services of the Plant Genome Data and Information Center for obtaining accession numbers for papers included in SoyBase but not indexed by Agricola. This was useful to the extent that a paper relevant to our database might in theory be valuable to others. We no longer request accession numbers because of the time delay involved in the many steps of the indexing process. If Agricola would increase the journals indexed and expand the concept of what is important to agriculture, it would be more useful to us and probably also to the agricultural research community in general.

Another service that the Plant Genome Data and Information Center provides is to publicize our database at meetings throughout the United States. Since we do not have the funds nor the time to personally attend many of these conferences, their presence and the attendant publicity has been very helpful in getting the word out about SoyBase.

In summary, Plant Genome Data and Information Center personnel have been and continue to be of great value to us.

David Grant
Curator SoyBase Database
Iowa State University

Phone: (515) 294-1205
dgrant@iastate.edu

Date: Mon, 24 Mar 97 08:38:51 EST
From: Edie Paul <epaul@nightshade.cit.cornell.edu>
To: bbuchana@nal.usda.gov
Subject: Re: Support Paragraph Requested

I'm happy to support and endorse the services you provide. The literature searches and extractions you do are wonderful, and represent a task I would personally never be able to perform myself. I believe we have close to 1,000 references loaded into the RiceGenes database. These references are very helpful for our user group because many of them do not have easy access to published material. I have also directed a number of people to your web site as a source for additional information. I look forward to continued collaboration with the Plant Genome Data and Information Center; the group has always been very supportive and willing to help out our database effort in any way it can. Thanks!

Regards,
Edie Paul
Curator, RiceGenes database

Date: Tue, 25 Mar 1997 14:49:06 -0800 (PST)
From: David Flanders <flanders@genome.Stanford.EDU>
To: Barbara Buchanan <bbuchana@nal.usda.gov>
Cc: Mike Cherry <cherry@genome.Stanford.EDU>
Subject: Support Paragraph Requested

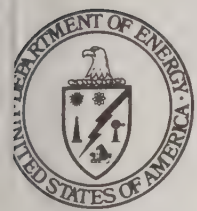
SUPPORTING STATEMENT

The Arabidopsis thaliana database (AtDB) project, in the Dept. of Genetics, Stanford University is currently funded by the National Science Foundation to develop a new genomic database. While doing this, the project is also seeking to maintain a level of "curation", i.e., maintenance of existing, and incorporation of new, data.

In this last-mentioned regard, the regular literature searches kindly done, and supplied by, Barbara Buchanan to AtDB are of considerable aid to the project. Arabidopsis literature is scattered and the Agricola records she provides saves the project time and effort, and, once incorporated into AtDB, are a valuable resource for users.

David Flanders, Ph.D.
AtDB Curator

David Flanders	flanders@genome.stanford.edu
AtDB Curator	http://genome-www.stanford.edu/
Dept. of Genetics	FAX: +1-415-723 7016
School of Medicine	Tel: +1-415-725 3062 (direct)
Stanford University	(Please note: area code switches
Stanford	from 415 to 650 on 2 Aug, '97)
CA 94305-5120	
U.S.A.	



Department of Energy

Washington, DC 20585

December 28, 1994

Dr. Susan McCarthy
Plant Genome Information Center
National Agricultural Library
10301 Baltimore Blvd., 4th floor
Beltsville, MD 20705

Dear Dr. McCarthy:

I want to thank you and Barbara Buchanan for all your help in generating the data for the enclosed graph. This figure will appear in the next progress report (Year Four) by the Multinational Coordinated *Arabidopsis thaliana* Genome Research Project. Barbara also took time to survey the *Arabidopsis* publications data for those publications that also included reference to one or more of 11 different crop plants. These data, provided by Barbara, are summarized in the following paragraph.

"Genetic comparisons between *Arabidopsis* and crop species is increasing. For example, in addition to *Arabidopsis*, plant databases are being developed for many crop plants including soybean, rice, maize, wheat, barley, rye, pepper, tomato, potato, cotton, and sorghum. A small bit of evidence for genetic correlations between *Arabidopsis* and crop plants comes from the publication data given in Figure 1 where 90 of the 339 *Arabidopsis* publications in 1993 also listed one or more of the 11 crop plants mentioned above in the publication's title or abstract. This is an underestimate of scientific correlation because it does not include a count of the crop related references cited in *Arabidopsis* publications nor does it measure how frequently other publications on crop plants cite scientific reports on *Arabidopsis*."

Again we appreciate the rapid and helpful service provided by you and the Plant Genome Information Center at the National Agricultural Library.

Sincerely,

A handwritten signature in dark ink, appearing to read "James E. Tavares", is written over a circular stamp. The stamp is partially visible and contains some illegible text.

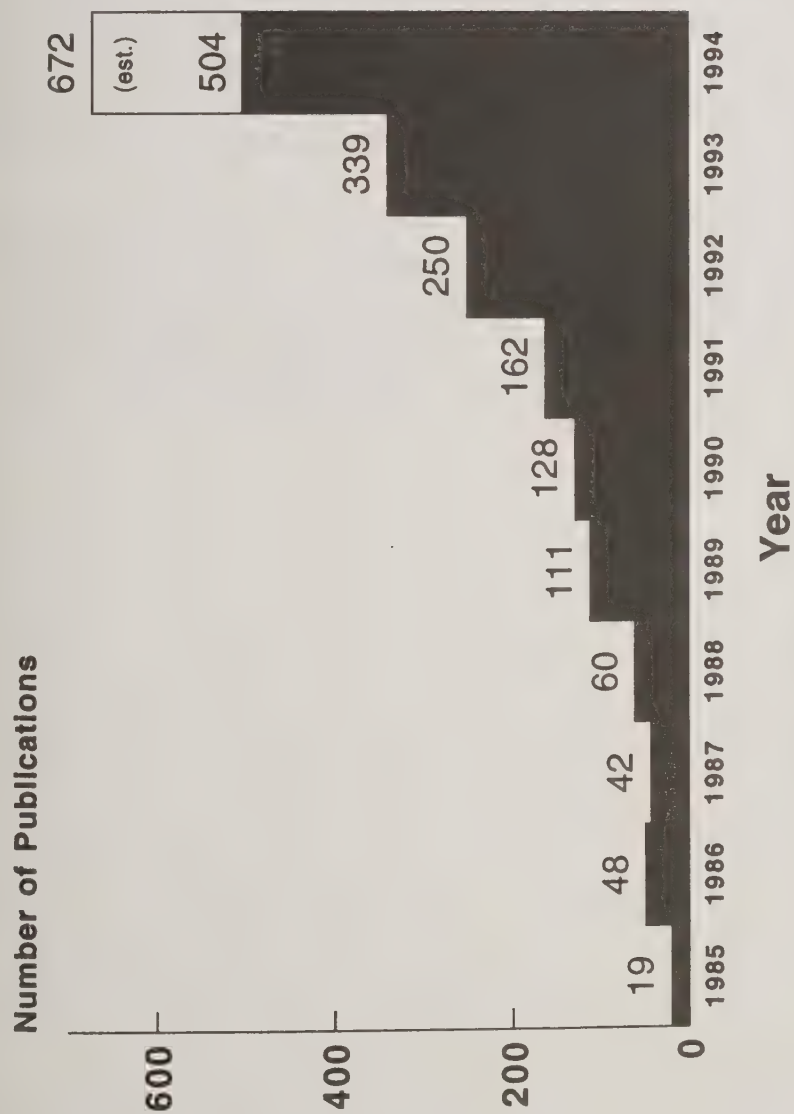
James E. Tavares, Biologist
Division of Energy Biosciences
Office of Basic Energy Sciences, ER-17

cc: Barbara Buchanan



Printed with soy ink on recycled paper

Arabidopsis Publications



Data derived from a search of BIOSIS for publications or descriptors listing Arabidopsis or thaliana
SOURCE: Barbara Buchanan, Plant Genome Information Center, National Agricultural Library, U.S.D.A.

**National Science Foundation
Division of Biological Instrumentation and Resources
Directorate for Biological Sciences**

**4201 Wilson Blvd., Arlington, VA 22230
Phone (703)306-1422: Fax (703)306-0349**

May 2, 1995

To: Contributors to the 4th annual progress report for The Multinational Coordinated Arabidopsis Genome Research Project

From: Machi F. Dilworth, NSF

I am pleased to forward the just published annual progress report of the Multinational Coordinated Arabidopsis Genome Research Project. On behalf of Liz Dennis, the chair of the multinational science steering committee for the Arabidopsis research project, I would like to express sincere appreciation for your assistance. Anne Moffat will return the photos to those of you who provided them for the publication.

As before, the EC Headquarters have two hundred copies for distribution in Europe and U.K. All registrants at the Madison meeting this June will receive a copy along with their registration materials. A notice for the report will be placed on the Arabidopsis bulletin board as well. This report will appear on the NSF MOSAIC home page within a couple of weeks. If you need additional copies, please let me know.

Best wishes

Machi

Date: Fri, 14 Jun 1996 06:56:35 -0600
From: Howard F. Schwartz <hschwartz@ceres.agsci.colostate.edu>
To: Susan McCarthy <smccarth@nal.usda.gov>
Cc: Phil McClean <mcclean@beangen.es.cws.ndsu.nodak.edu>
Subject: Re: Digitizing BIC Annual Reports

Dear Susan,

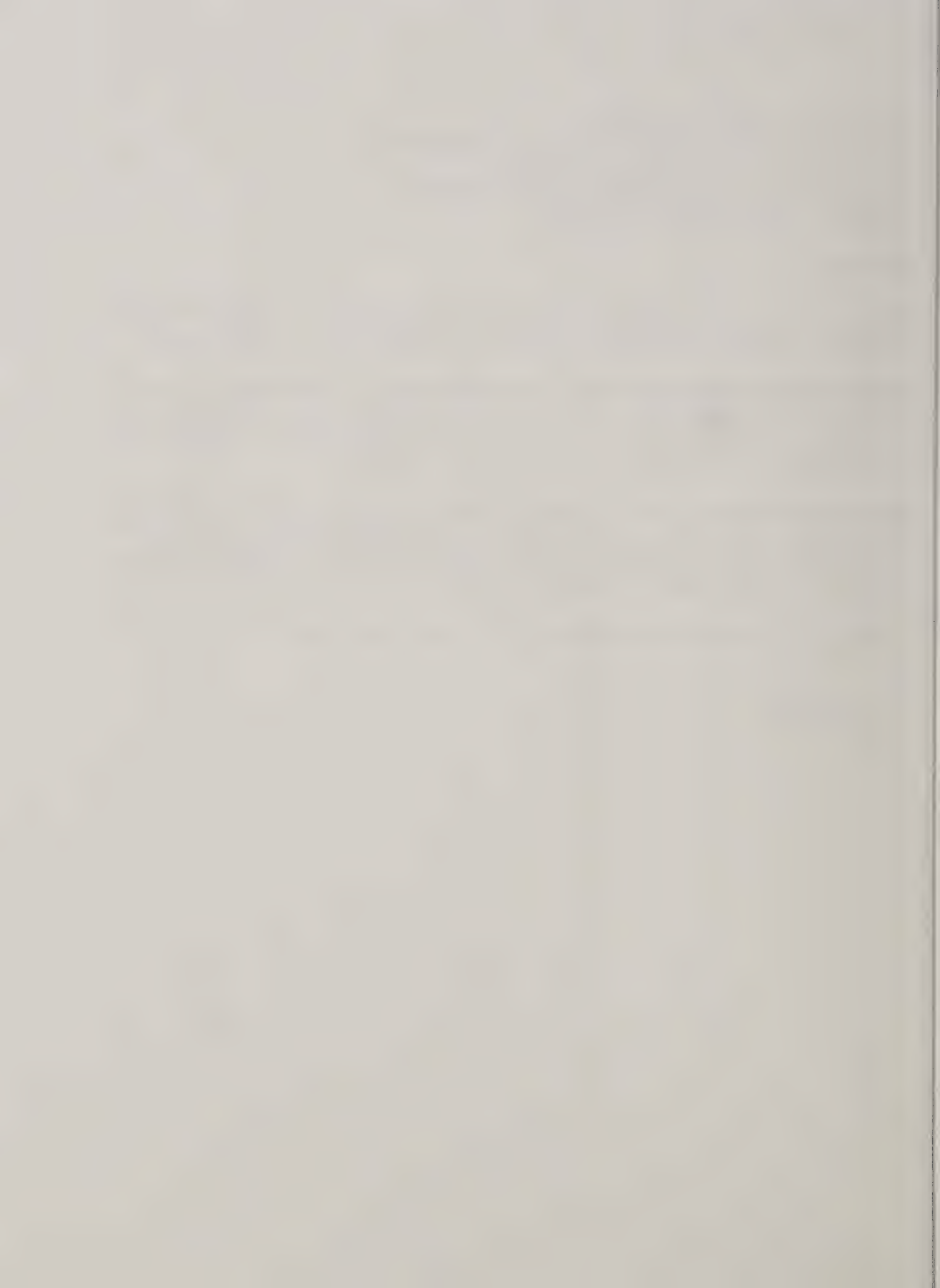
Thank you for the update on inclusion of the BIC in the digital core. This is very exciting and worthwhile for the bean community, and we are all very appreciative of your efforts and support.

Regarding the ongoing maintenance of this format for future issues, I feel that the BIC can provide an electronic copy of future issues that will "only" require formatting. Most of our members can accommodate this request, in addition to our regular request for a printed version. The BIC can then solicit support from the industry to scan a copy of the rest of the reports.

We request that our members provide reports by February 15 of each year; I allow an additional 2 weeks for delayed receipt of some reports. Therefore, the printed report is usually available March 1 for duplication, binding and distribution by mid April. I feel that we could complete the scanning during this time period so that a complete electronic file of the report could be sent to you by May.

Again, thank you for your support of this project and the opportunity to improve access to nearly 40 years of resources.

Howard Schwartz
BIC President





National Institutes of Health
National Library of Medicine
Bethesda MD 20894

January 23, 1995

Barbara Buchanan
Librarian
Plant Genome Data and Information Center
National Agricultural Library
10301 Baltimore Blvd.
Beltsville, MD 20705-2351

Dear Ms. Buchanan:

It has taken far longer than expected, but we have finally completed our review of the 1993 output from Commonwealth Agricultural Bureaux International File. This review, summarized on the enclosed page, confirms our suspicions from the BIOSIS review discussed at our April meeting: we are already covering the core journals that contain published nucleotide sequences. We will not continue to pursue the small number of articles identified by other databases.

The National Library of Medicine recently has reconsidered the utility of the separate BIOTECHSEEK database, and plans to discontinue it in mid-1995. With only two or three exceptions, however, the journals that had been indexed for BIOTECHSEEK will continue to be indexed for MEDLINE as "Special List B" titles. This means that they will be indexed according to routine selection criteria for MEDLINE, but that the citations will not appear in Index Medicus. Please keep the BIOTECHSEEK/MEDLINE merger confidential until NLM officially announces it to our users. The announcement probably will not occur before May.

I would like to thank you and your colleagues for your assistance on this project, and to convey the best wishes of the Index Section for the New Year.

Sincerely,

Nancy D. Wright
Head, Index Section
Bibliographic Services Division

enclosure

cc: Dr. Benson, NCBI

Appendix 6. List of Strawberry Project Advisors

List of Advisors to the History of Strawberry Breeding Project

Advisers to the Strawberry Improvement Project

Dr. James Reveal, *Professor, Univ. of Maryland, Dept. of Plant Biology*

Dr. Chad Finn, *Research Geneticist, USDA-ARS Northwest Center for Small Fruits Research*

Dr. Kim Hummer, *USDA-ARS National Clonal Repository*

Ms. Denise Kurtz, *Granddaughter of George Darrow*

Dr. Ray Altevogt, *Former consultant to the Fresh Fruit & Produce Association*

Dr. Gene Galletta, *Research Geneticist, USDA-ARS Fruit Laboratory*

Dr. John Mass, *Plant Pathologist, USDA-ARS Fruit Laboratory*

Dr. James Ballington, *Professor, North Carolina State University, Dept. Hort. Science.*

Mrs. Jean Wallace Douglass, *Honorary President, Henry A. Wallace Institute for Alternative Agriculture and daughter of Henry Wallace.*

Appendix 7. WWW Statistics by Calendar Year

Summary of PGDIC WWW Statistics:

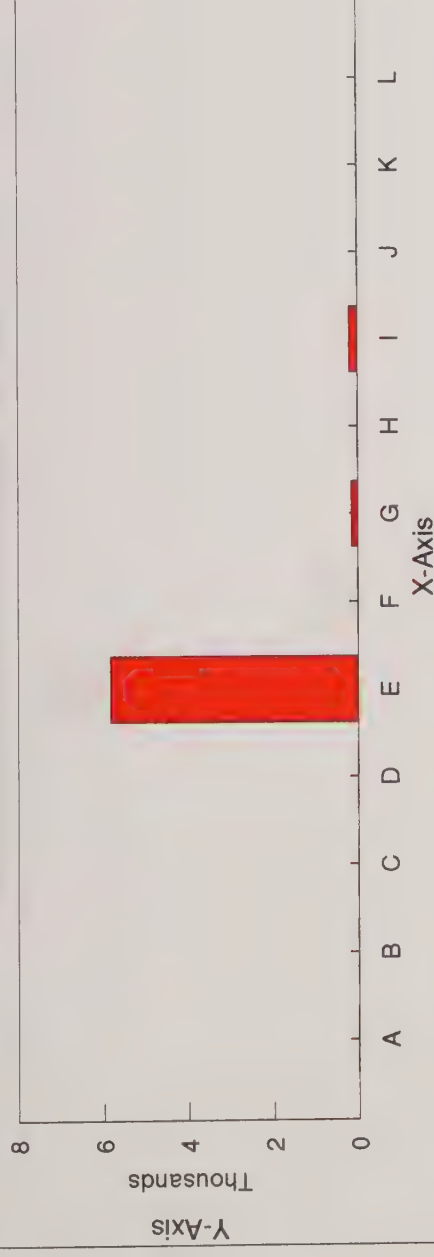
1) WWW Hits By Category

- a) 1995
- b) 1996
- c) 1997

2) WWW Users By Affiliation

- a) 1995
- b) 1996
- c) 1997

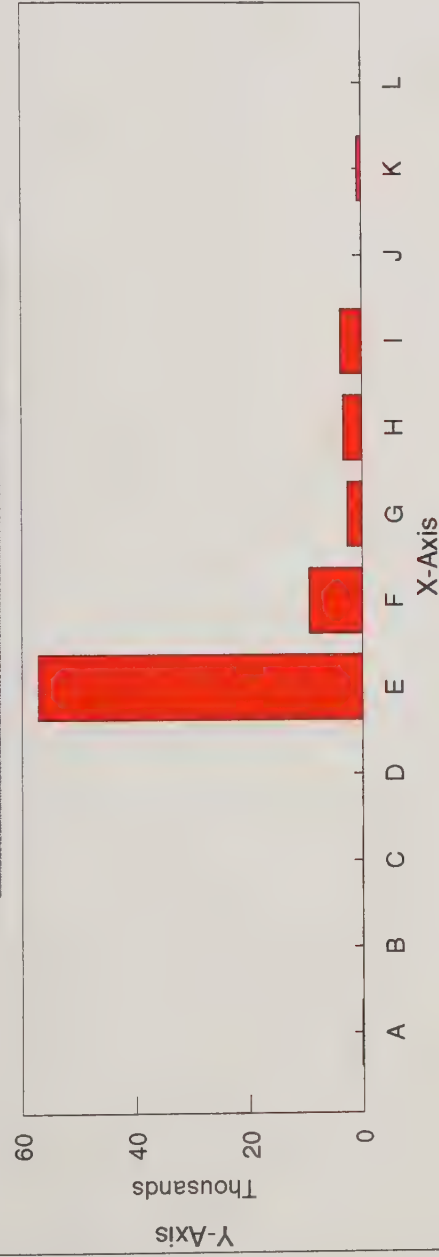
WWW Hits By Category 1995



A - Patents
 B - Significant Pubs 1991
 C - Plant Genome Grant
 Recipients 1991-1995
 D - Sponsored CRIS/ICAR
 Projects
 E - Probe Newsletter
 F - BIC articles
 G - Nuclear DNA content
 H - Plant DNA Library
 I - Germplasm
 J - Experimental Concepts
 K - Molecular Marker Research
 Projects
 L - Plant Genome Mapping
 Projects

LEGEND: The NAL WWW server began official operation in April 1995. Statistics reflect useage from April through December 1995. Accordingly, the Y-Axis ranges from 0 - 8 thousand. Similar Y-Axis deviations hold for the WWW statistics by user category.

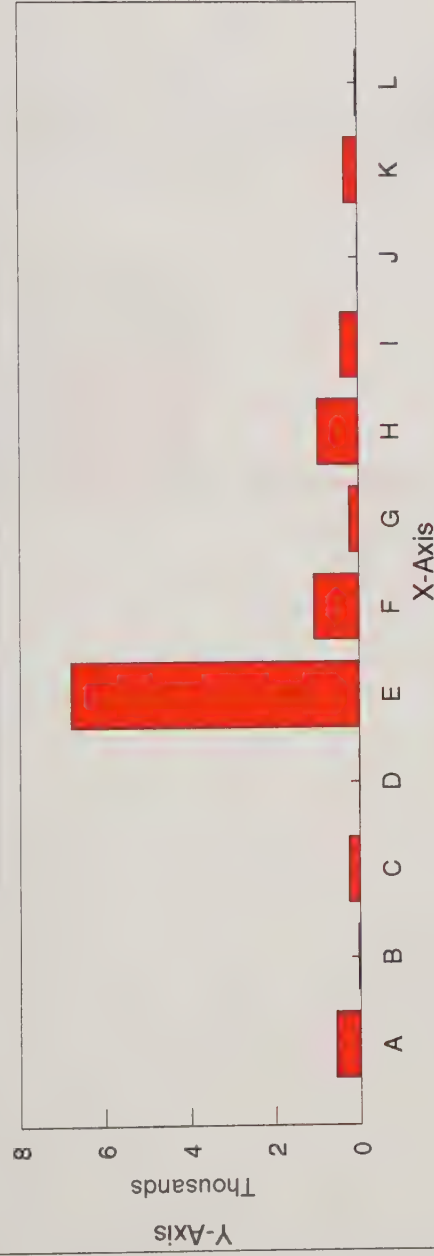
WWW Hits By Category 1996



A - Patents
 B - Significant Pubs 1991
 C - Plant Genome Grant
 Recipients 1991-1995
 D - Sponsored CRIS/ICAR
 Projects
 E - Probe Newsletter
 F - BIC articles
 G - Nuclear DNA content
 H - Plant DNA Library
 I - Germplasm
 J - Experimental Concepts
 K - Molecular Marker Research
 Projects
 L - Plant Genome Mapping
 Projects

LEGEND: 1996 represents the first full calendar year for WWW statistics. Accordingly, the Y-Axis ranges from 0 - 60 thousand.
 Similar Y-Axis deviations hold for the WWW statistics by user category.

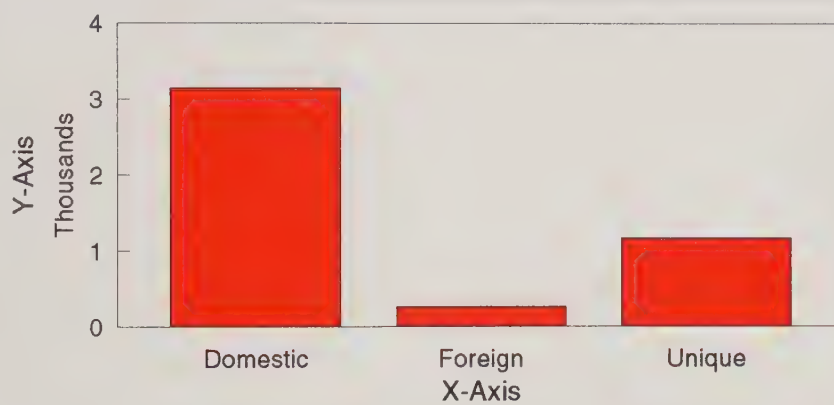
WWW Hits By Category 1997



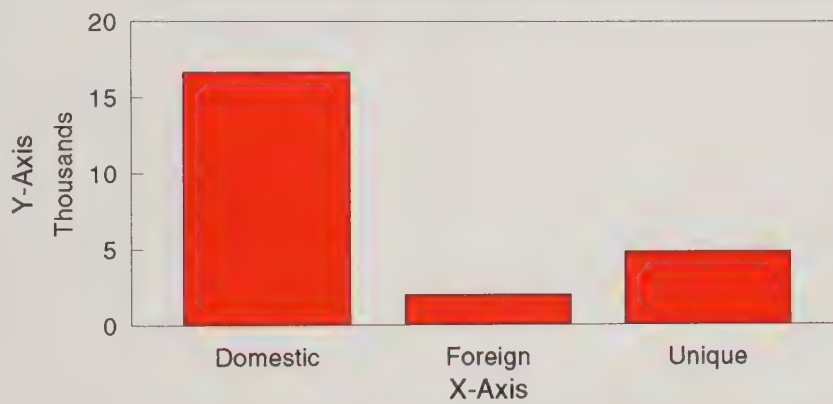
A - Patents
 B - Significant Pubs 1991
 C - Plant Genome Grant
 Recipients 1991-1995
 D - Sponsored CRIS/ICAR
 Projects
 E - Probe Newsletter
 F - BIC articles
 G - Nuclear DNA content
 H - Plant DNA Library
 I - Germplasm
 J - Experimental Concepts
 K - Molecular Marker Research
 Projects
 L - Plant Genome Mapping
 Projects

LEGEND: The 1997 statistics cover January 1 through March 31, 1997. Accordingly, the Y-Axis ranges from 0 - 8 thousand. Similar Y-Axis deviations hold for the WWW statistics by user category.

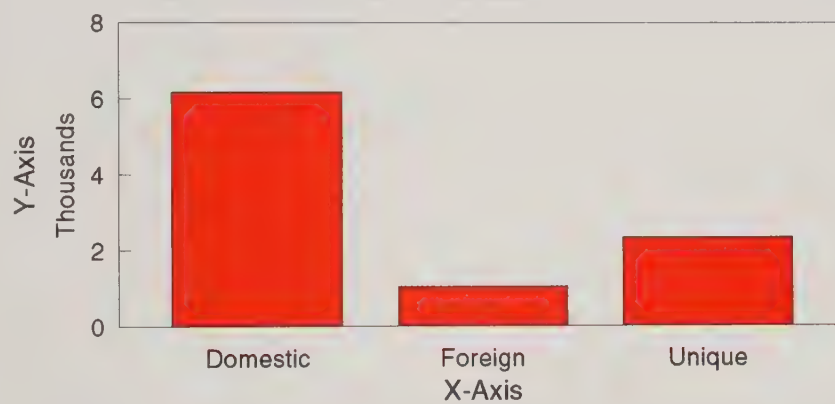
WWW Users by Affiliation 1995



WWW Users by Affiliation 1996



WWW Users by Affiliation 1997



Appendix 8. CVs from PGDIC Staff

Current *Curriculum Vitae* and Resumes for all professional staff.

- a) Susan McCarthy
- b) Barbara Buchanan
- c) Terrance Henrichs
- d) Judy Ruttenberg
- e) Michael Tims
- f) Shilpa Shenvi
- g) Dan Cabirac
- h) Andrew Kalinski

Curriculum Vitae

Susan Arlene McCarthy

Plant Genome Data and Information Center
United States Department of Agriculture
National Agricultural Library
Beltsville, MD 20705

Education:

B.S. Botany	1975	University of Michigan, Graduated in Honors with Distinction
Ph.D. Biology	1981	University of Illinois, Plant Physiology Program Dr. C. Rebeiz, advisor

Positions Held:

Teaching Assistant	1975-1977	University of Illinois
Research Assistant	1977-1980	University of Illinois
Postdoctoral Research Fellow	1980-1983	University of Nebraska
Postdoctoral Research Fellow	1984-1986	Administrator's Fellow (one of 35 national appointments); USDA/Agricultural Research Service (ARS)
Postdoctoral Research Fellow	1986-1990	Research Chemist; USDA/ARS
Technical Information Specialist	1990-present	Coordinator, Plant Genome Data and Information Center; National Agricultural Library (NAL)
	1992-1993	Acting Coordinator, Biotechnology Information Center (NAL)
	1996-1997	Acting Coordinator, Biotechnology Information Center (NAL)

Professional Societies:

American Society of Plant Physiologists
American Association for the Advancement of Science
Special Libraries Association
Chair, Biotechnology Roundtable; Special Libraries Assoc. 1993-1995

Experience

Communication:

- Authored over 20 peer-reviewed research articles.
- Initiated and served as managing editor, *Probe*, the Official Newsletter of the Plant Genome Research Program (1991-1996).
- Presented research findings and Plant Genome Program Information at many regional, national, and international meetings.

Research and Development:

- Discovered new chlorophyll intermediate and developed a new model for the biosynthetic pathway to account for the novel pigment.
- Identified a second low-affinity atrazine binding site on the D2 Photosystem II Reaction Center Protein.
- First reported post-transcriptional regulation of gene expression in *Euglena*.
- Analyzed valyl-tRNA synthetase activity as a function of light and nutritional regulation.
- Performed fluorescent spectral analysis to characterize certain *Euglena* mutants.

Teaching/Training:

- Supervised College level laboratory courses and conducted lectures as needed.
- Taught the Phase I training class in Molecular Biology E-Mail Servers since 1995.
- Significantly revised the Phase I training class and manual.
- Arranged NAL staff training in general genetics.
- Arranged and participated in training Librarians to search GenBank and other sequence databases using the Intelligenetics Software Suite.
- Provided one-on-one training in technical skills, both laboratory and library based.

Project and Administrative Management:

- Established the Plant Genome Data and Information Center and its programs throughout NAL, managed the budget process (1991-1995).
- Conceptualized and wrote detailed project plan for the BIC Digital Conversion Process.
- Initiated and facilitated Center staff to complete many valuable projects for the Plant Genome Research Program and the National Agricultural Library.
- Supervised staff of PGDIC of up to 7, keeping focus on major goals, through e-mail updates, calendars, and meetings.
- Served as the ARMP's (ARS, budget process) contact for the Public Services Division (1995-1997) and compiled initial Divisional budget plans.
- Provided scientific leadership and guidance for PGDIC and NAL staff in the subject specialties of genetics and plant biology, biochemistry.
- Provided overall management of Center's "All Other" operating budget.
- Developed, maintained, and resolved conflicts for 8-10 Specific Cooperative Agreements. Served as the NAL resource in developing the first new agreement under tighter ARS requirements.
- Served as a representative on many NAL committees.

Short Courses and Workshops:

AGRICOLA Basic Training Course

AGRICOLA Advanced Training Course

CRIS/USDA Online Workshop

Management Skills for New or Prospective Managers

Building Assertiveness for Professional and Personal Success

How to write, edit, and design newsletters

Writing and designing successful promotional materials

Designing with desktop publishing

Intelligenetics Suite / Molecular Biology Software

How to Solve Communication Problems
Introduction to Supervision
Critical Thinking
Managing Other People's Writing
Total Quality Management
Dialog Basic Systems Course
Predicasts/Basic Search Skills
Seven Habits of Highly Successful People
Myers-Briggs Introductory Course
Myers-Briggs Advanced Course
ARS Cooperative Agreements Training
How to Develop and Administer a Budget

Selected Publications:

McCarthy SA (1981) Studies on the Biosynthesis of Protochlorophyllide Ester in Etiolated and Green Tissues of Higher Plants. Ph.D. Thesis, Urbana, Illinois

McCarthy SA, JR Mattheis, CA Rebeiz (1982) Chloroplast Biogenesis: Biosynthesis of Protochlorophyll(ide) via Acidic and Fully Esterified Biosynthetic Branches in Higher Plants. *Biochemistry* 21:242-247

McCarthy SA, L James, SD Schwartzbach (1982) Photo and Nutritional Regulation of Chloroplast Valyl-tRNA Synthetase in *Euglena*. *Arch. Microbiol.* 133:149-154

McCarthy SA, SD Schwartzbach (1984) Absence of Photoregulation of Abundant mRNA Levels in *Euglena*. *Plant Sci. Lett.* 35:61-66

Eskins K, ME Duysen, L Dybas, SA McCarthy (1985) Light Quality Effects on Corn Chloroplast Development. *Plant Physiol.* 77:29-34

Eskins K, S McCarthy, L Dybas, M Duysen (1985) Corn Chloroplast Development in Weak Fluence Rate Red Light and Weak Fluence Rate Red plus Far-Red Light. *Physiol. Plant.* 67:242-246

Eskins K, S McCarthy (1986) Efficiency of Low Irradiance Red and Blue Light in Development of Corn Mesophyll and Bundle Sheath Chloroplast. In: *Plant Biology* (G Akoyunoglou et al., eds) Vol 2, pp 663-670

Dennenberg RJ, PA Jursinic, SA McCarthy (1986) Intactness of the Oxygen-Evolving System in Thylakoids and Photosystem II. *Biochim. Biophys. Acta* 852:222-233

Monroy AF, SA McCarthy, SD Schwartzbach (1987) Evidence for Translational Regulation of Chloroplast and Mitochondrial Biogenesis in *Euglena*. *Plant Sci.* 51:61-76

Eskins K, SA McCarthy (1987) Blue Red and Blue Plus Red Light Control of Chloroplast Pigment and Pigment-Proteins in Corn Mesophyll Cells Irradiance Level-Quality Interaction. *Physiol. Plant.* 71:100-104

Jursinic PA, SA McCarthy, TM Bricker, A Stemler (1991) Characteristics of Two Atrazine-Binding Sites that Specifically Inhibit Photosystem II Function. *Biochim. Biophys. Acta* 1059:312-322

McCarthy S (1991) Information Superhighway Envisioned-Legislation Pending to Establish National Computer Network. *Probe* 1:8-9

McCarthy S (1991) French Join the International Human Genome Effort. *Probe* 1:10

McCarthy S, (1991) USDA's Plant Genome Research Program. *ALIN* 17 (10):1-6

McCarthy S, (1992) Japan's Rice Genome Program. *Probe* 2 (1):14-15

McCarthy S, (1992) Plant Genome Research Grant Program: First Annual Report - 1991. *Probe* 2(1):4-5

McCarthy S, (1992) The Federal Biotechnology Commitment. *Probe* 2(1): 14-15

McCarthy S, (1992) APINMAP--An Asian Medicinal Plants Database. *Probe* 2(3):28-29

McCarthy S, (1993) Genome Conservation Highlighted at Plant Genome I Conference. *Probe* 3(1/2):21-22

McCarthy S, (1994) Plant Genome II Conference Report. *Probe* 4(1/2):12-14.

Quebedeaux B, Kalinski A, McCarthy S, and Byrne P, (1995) Plant Genome III. *Probe* 5(1):10-13.

McCarthy S, (1995) New Plant Genome Information -- Online! *Probe* 5(2):9-10.

McCarthy S, (1996) SGML--Enhances Access to Digital Information. *Probe* 6(Final):27.

McCarthy S, (1996) Transitions. *Probe* 6(Final):28.

Tims M, and McCarthy S (1997) Bean Improvement Cooperative Digital Conversion Project. Submitted for Volume 40 of the BIC Annual Reports.

Bottino P, and McCarthy S, (1997) Electronic Resources in Molecular Biology and Plant Breeding. Solicited Book Chapter in preparation.

Barbara Buchanan
1327 Chilton Drive
Silver Spring, MD 20904
(301) 504-7048
bbuchana@nal.usda.gov

Education:

USDA Upward Mobility Program Requirements:
60 semester hrs. 1981-1987, University of Maryland, College Park

Office of Personnel Management, Librarian Examination 1985 (fulfilled education requirements for Librarian Series 1410)

Work Experience:

National Agricultural Library 1969 to present

Public Services Division, Plant Genome Data and Information Center (PGDIC)

November 1991 to Present - Biological Sciences Librarian (Series 1410)

Responsibilities and Accomplishments:

- NAL/NLM GenBank Scanning Project--collaborative effort assisting NLM review their indexing and selection criteria used to identify material for the GenBank database
- NSF/DOE Multinational Coordinated Arabidopsis thaliana Genome Research Project--conducted a citation index analysis of the BIOSIS database.
- Animal Genome Project--conducted a citation index analysis of the BIOSIS, SciSearch and Pascal databases (requested by Dr. J. Lunney, ARS)
- NRICGP/CSREES Plant Genome Grants Recipients Analysis--conducted a citation index analysis of the AGRICOLA database (requested by S. Edwards, Head, Indexing Branch, NAL)
- NRICGP/CSREES Plant Genome Grants Recipients Listings--created a listing of all grant recipients for the years 1991-1995 including the CRIS and AGRICOLA databases accession numbers with hypertext links to the CRIS record. The 1996 listing is in progress.
- NRICGP/CSREES Plant Genome Grants Recipients Significant Publications Bibliographies--create bibliographies of all published works of grant recipients. Enhance the bibliography with CRIS and AGRICOLA database accession numbers and make hypertext links to the CRIS record.
- create information products, subject bibliographies, reference products/tools.
- provide information services for patrons.
- conduct training sessions on molecular biology e-mail servers.
- copyright authority for PGDIC to ensure legal compliance with U.S. Copyright Law
- provide copyright presentation to Plant Genome Database coordinators and support staff.
- negotiate copyright clearance agreements and royalties as appropriate.

- provide detailed database literature search services (BIOSIS, AGRICOLA, CRIS) to the following Plant Genome Databases: Soybase (including Metabolic Pathways), AtDB, RiceGenes, CottonDB and QTL (P. Bryne). Currently additional searches are being initiated with these databases: BeanGenes, RoseDB, Alfalfa, and GrainGenes.
- provide detailed AGRICOLA database literature search for Barley Project including mapping, qtls and traits and mapping and traits for triticeae.
- provide genetic sequences to Soybase database from Entrez database..
- create and convert existing documents into HTML and enhance PGDIC homepage.
- maintain accuracy and currency of PGDIC homepage.
- analyze NAL collection for plant genetic materials, identify gaps and recommend items for acquisition.
- revise, update and create additional Plant Genome Mapping Projects Files.
- revise, update and create additional listings for the Directory of Molecular Marker Research Projects Listings Files.
- analyze AGRICOLA database for animal genome coverage and recommend items for indexing with special emphasis on literature needed for the Plant Genome Database(s).
- produce calendar of events for the plant genome community.
- represent PGDIC at professional meetings and conferences.

Public Services Division, Document Delivery Services Branch

February 1989 to October 1991 - Assistant Branch Head (Librarian Series 1410)

Responsibilities and Accomplishments:

- Contracting Office Technical Representative on document delivery services contract responsible for overall contractor performance including budget, workflow, policy, procedures, quality, quantity, statistics, etc.
- implement and manage integrated library system within the Branch.
- develop and negotiate new agreements with other libraries and cooperating institutions.
- supervise office support staff and mentor professional and technical staff
- develop position descriptions, standards and other personnel documents.
- prepare budgetary and statistical reports.
- assist Branch Head in developing and implementing programs and policies for the Branch.

Technical Services Division, Cataloging Branch

February 1986 to January 1989 - Supervisory Librarian (Series 1410)

Responsibilities and Accomplishments:

- supervise technical staff (planning, organizing, staffing, directing and training)
- develop new procedures to improve workflow and production.
- prepare reports and documents relating to personnel management, policies, budget plans, etc.
- catalog scientific and technical publications
- maintain the Cataloging Master File of the AGRICOLA database.

Technical Services Division, Program Staff

November 1984 to January 1986 - Librarian (Series 1410, trainee position)

Trainee in the various information services provided by the NAL as part of the USDA Upward Mobility Program:

- professional rotational assignments in all library activities.
- supervise technical staff, Serials Branch, 50% of official duty time.

Technical Services Division, Indexing Branch

September 1982 to October 1984 - Supervisory Library Technician

Responsibilities and Accomplishments:

- supervise Data Entry Unit staff (planning, organizing, staffing, directing and training)
- recruit and hire personnel
- develop new procedures to improve workflow and production.
- prepare reports and documents relating to personnel management, policies, budget plans, etc.
- maintain the Indexing Master File of the AGRICOLA database
- transliterate Cyrillic alphabet bibliographic data for technical staff
- Contracting Office Technical Representative on keyboarding contract responsible for overall contractor performance including budget, workflow, policy and procedures, quality and quantity control, statistics, approval for payment, etc.
- serve as Equal Employment Opportunity Counselor 10% of official duty time.

Technical Services Division, Indexing Branch

June 1974 to August 1982 - Library Technician

Responsibilities and Accomplishments:

- keyboard bibliographic data for the AGRICOLA database.
- transliterate Cyrillic alphabet bibliographic data.
- maintain various computer files including the Indexing Master File of the AGRICOLA database.
- compile statistics
- prepare serial check-in records.
- various technician related activities.

Public and Technical Services Divisions, Reference and Indexing Branches

June 1969 to May 1974 - Library Clerk

Various clerical and library related duties as assigned

Publications:

"Agricultural Document Delivery: Strategies for the Future". Library Trends, Winter 1990.
(Co-Author)

"The Role of Arabidopsis in Plant Science Research". The Multinational Coordinated Arabidopsis thaliana Genome Research Project Progress Report: Year Four, December 1994. (Contributor)

"Appendix 2 Recent Publications on Arabidopsis Arranged by Journal". The Multinational Coordinated Arabidopsis thaliana Genome Research Project Progress Report: Year Five, December 1995. (Contributor)

Additional Skills:

Computer skills: Windows, Visual dBASE, UNIX, HTML

Online search skills: Advanced DIALOG, CRIS, Entrez, AGRICOLA, BIOSIS, CAB, ISIS, OCLC.

Additional Accomplishments:

Office of Personnel Management, Librarian Exam - August 1985

Equal Employment Counselor - 1981-1985

USDA Upward Mobility Program - 1981-1983.

NAL Upward Mobility Program - 1984-1987.

Professional Societies: Special Libraries Association

Specialized Workshops/Training:

AGRICOLA Basic and Advanced Training, Spring 1992.

CRIS/USDA Online Workshop, Spring 1992.

Intelligenetics Software Suite Training, June 1992.

Special Libraries Association Workshop "Copyright of Electronic Information: User and Producer Perspectives", March 1993

Dialog Basic Systems Course, Spring 1993.

Predcasts/Basic Search Skills, Spring 1993.

Special Libraries Association Continuing Education Course, "US Copyright Law in the Age of Technology", June 1993.

Copyright Society of the USA Seminar, "Copyright Implications of the National Information Infrastructure", Assistant Secretary and Commissioner of Patents and Trademarks, Bruce Lehman, May 1994.

National Agricultural Library, "US Copyright Seminar", June 1994.

Dialog Database Corporate Counsel, "Copyright Law", June 1994.

National Center for Biotechnology Information Workshop, "Biotechnology Information: Searching, Retrieving, and Analyzing Information from GenBank and Other Biological Databases", April 1996.

Myers-Briggs Introductory Course, Sept. 1996.

Awards:

Dean's List University of Maryland 4.0 GPA - 1982, 1985.

Federal Women's Program Managers Council of USDA honoree - 1987.

Certificates/Letters of Appreciation - 1971, 1981, 1983, 1985, 1987, 1988, 1989, 1990, 1991

Superior Performance Cash Award (\$1,000) - 1985

Cash Awards - 1985, 1987, 1992, 1993, 1995.

Terrance L. Henrichs

3374 Wye Mills South

Laurel, MD 20724

(301) 490-1075

Education

Prince George's Community College
301 Largo Road
Largo, MD

36 semester hours

Continuing Education

Have received the following continuing education related to layout and design:

How to Design a Newsletter
What's Hot in Design
Introduction to PageMaker
Intermediate PageMaker
Advanced PageMaker
Desktop Publishing Design

Micrographix Designer
Designing with Desktop Publishing
Powerhouse Graphics Workshop
Proofreading
One-on-one Advanced Training in Layout and
Design Techniques

Have received the following continuing education related to printing materials:

Getting Printed Materials Produced

Have received the following continuing education related to personnel administration:

Supervising People
Critical Thinking
How to Work with People

Better Business Writing
Managing Other People
How to Solve Communication Problems

Have received the following continuing education related to hardware and software:

PC Coordinator Workshop
Introduction to DOS
Introduction to WordPerfect
Advanced WordPerfect
Introduction to Multimate
Advanced Multimate
Introduction to LOTUS
Troubleshooting and Maintaining the
IBM-PC, XT, AT, and Compatibles

Introduction to Windows
LOTUS Freelance Plus
LOTUS Intermediate Applications
Advanced LOTUS
FileMaker Pro
Introduction to dBase Plus
Applications of dBase Plus

Have received the following continuing education related to electronic publishing:

Introduction to Multimedia
Creating Multimedia Applications
Understanding the Internet
Introduction to Photoshop

Web Authoring
Introduction to Standard General Markup Language
Introduction to Hypertext Markup Language

Have received the following continuing education related to administration support:

Secretary as a Manager
Telephone Techniques

Time Management
Management Skills for Secretaries

Have received the following continuing education related to information research:

AGRICOLA and CRIS Database Workshop
PREDICASTS and IAC Databases Workshop

Most of these classes were taken through the USDA Graduate School and the rest via certified training vendors.

Work Experience

March 1991-Present

USDA, ARS, NAL, PSD, RUSB, Plant Genome Data and
Information Center

Classified as a Office Automation Assistant, GS-326-7/10. Full-time employee. Below is a summary description of the duties and areas of responsibilities that I have performed since joining the Center.

Probe Newsletter:

Production manager - responsible for all contracts, copyright, photographic, agency and Departmental clearances. Manage overall editorial process, including: in-house review; contract editorial staff; and programmatic review. Maintain all paperwork and related materials for each issue of the *Probe* newsletter including film negatives. Supervise staff in maintaining current mailing lists and coordinating printing labels with production.

Designer - research and design appropriate images to enhance the readability of the text. Layout each issue, including color separations for a two-color publication. Prepare all photographs for reproduction, cropping and using proportional scale to determine percentage of original size. Create original designs for special announcements and prepare final camera-ready copy.

Electronic publication - convert original WordPerfect documents into HTML for uploading onto the PGDIC-WWW site.

Other Design Work:

Presentations - work closely with Center staff in preparing visual aids for conference presentations, training classes, and so forth.

Publications - significant work in designing PGDIC series publication covers; informational fliers; Manual covers (Secretarial Manual, Molecular Biology E-Mail Servers, etc.); Center brochures; occasional work in developing original publications.

Exhibits - worked with USDA contract designer in developing museum quality exhibit for NAL's first floor lobby. Recently designed a poster exhibit describing various publications formats currently being displayed on the Fourth Floor of NAL. Helped prepare exhibits for special emphasis programs.

Developed an entire promotional package for the 1996 Beltsville-Area Black History Month Observance. This included developing fliers, posters, and the layout for the program guide. This work was recognized by the Director of the Beltsville Area with a Spot Award.

World Wide Web - designed the PGDIC home page graphic. Working collaboratively on Center imaging projects with the Oregon Barley Wolf Pack. Have been given the lead responsibility for developing the on-line Plant Genome Database Tutorial. Considerable expansion of current duties expected in the coming year in this area therefore in the process of obtaining advanced training for proficiency purposes.

Administrative Management:

Property Management - maintain hardware and software inventories for the Center. Barcode all properties; provide reports as needed. Surplus materials, to other units whenever possible, when materiel no longer serves the needs of the Center.

Office Space Management - provided considerable assistance to the Center during recent renovation planning. Supervised several moves, located surplus furniture, and assisted in redesigning Center space utilization.

Budget Management - created and managed PGDIC's "All- Other" Budget, making extensive use of Lotus Macro's. Maintain files for each Specific Cooperative Agreement and file all paperwork for payments and amendments. Manage the USDA, IMPACT credit card purchases for the Center, track and file all reports. Personal limit for single item purchases is \$2,500 and monthly maximum is \$40,000. Assist center Coordinator with salary projections in preparing budgets for specific cooperative agreements.

Microcomputer liaison and technical support:

Troubleshooter - resolve hardware and software problems that occur within the center. Investigate and make recommendations for upgrades, new purchases, etc. Protects Center work with appropriate back-up and surge suppression equipment.

Setup and Installation - setup and install hardware and most software for center staff. Assist staff in getting started with new software packages. Includes designing PGDIC demonstration/NAL Imaging lab with furniture, hardware, software, and so forth.

Center and NAL Representative:

Exhibits - represents both the Center and NAL at conferences, training sessions, and annual meetings. Also by the provision of specially designed signs and other visual materials. Requires an in-depth knowledge of Center, as well as NAL functions, services, and products.

January 1987-March 1991

USDA, NAL, PSD, Document Delivery Services Branch

Classified as a Management Assistant (Data Transcribing), GS-344-7/4. Full-time employee. Responsible for handling the Regional Document Delivery Systems Cooperative Agreements. Troubleshooting any problems that occurred. Also responsible for tracking allotted money for each agreement. Performed microcomputer liaison duties. Also responsible for performing administration duties and generating reports on Branch activities. Also prepared monthly statistics on Branch activities.

January 1985-January 1987

USDA, NAL, PSD, Economics and Marketing Reference Branch, Farming and Forestry Reference Branch

Classified as a Secretary, GS-318-5/5. Full-time employee. Worked as secretary to 2 Branch Heads, 14 professional staff members, 1 library technician, and supervised 2 stay-in-school students. Responsible for mail, telephones, receiving visitors to the Branch, office supplies, typing branch correspondence, preparing time and attendance reports for Branch personnel, making travel arrangement for Branch personnel and processing all relevant paperwork, processing and tracking purchase orders and maintaining the Branch's budget.

September 1984-January 1985

USDA, NAL, TSD, Acquisitions Branch

Classified as a Secretary, GS-318-5/4. Full-time employee. Responsible for mail, telephones, receiving visitors to the Branch, office supplies, typing branch correspondence, preparing time and attendance reports for Branch personnel, processing received monographs to the Cataloging Branch, processing and tracking purchase orders and maintaining the Branch's budget.

May 1982-September 1984

USDA, ARS, NER, AEQI, Biologically Active Natural Products Laboratory

Classified as a Clerk-Typist, GS-322-4/4. Part-time employee. Responsible for typing various reports, manuscripts, correspondence, and scientific and technical materials in a wide variety of formats. Processing and tracking purchase orders. Also responsible for filing, office supplies, and preparing time and attendance reports for the lab personnel.

August 1979-May 1982

USDA, Food Safety Inspection Service

Classified as a Clerk-Typist, GS-322-4/3. Part-time employee. Responsible for developing microfiche-microfilm in-house conversion operation and filing system.

May 1975-August 1979

Student/Housewife and Mother

November 1974-May 1975

Rocky Gorge Animal Hospital

Classified as a Kennel Assistant. Part-time employee. Assisted Veterinarian with animals in hospital and kennel area in Laurel, Maryland.

March 1973-November 1974

Unemployed

September 1971-March 1973

U.S. Women's Army Corp

Classified as a Clerk-Typist with the rank of E-4. Worked as a Personnel Specialist at Ft. Meade, Maryland handling the military records of approximately 600 enlisted personnel. Received a honorable discharge (DD214 can be provided on request).

Awards:

March 1997 - Certificate of Merit. Citation: Outstanding services to the BARC region in the design and production of promotional materials for the 1997 Annual Black History Month Observance.

November 1995 - Certificate of Merit. Citation: For efforts that resulted in the development and successful implementation of the Molecular Biology E-Mail Server Training Program.

March 1993 - Certificate of Merit. Citation: For significant accomplishment in the development and continuing improvement of the official newsletter of the USDA, Plant Genome Research Program.

January 1993 - Quality Increase Award. Citation: For outstanding performance of duties.

March 1992 - Certificate of Merit. Citation: For contributions as a key member of the leadership team that guided the development of complex and innovative NAL data and information programs in support of USDA, Plant Genome Research Program.

February 1992 - Certificate of Merit. Citation: For significant services accomplishments in starting up new programs of the National Agricultural Library and the United States Department of Agriculture.

March 1991 - Quality Increase Award. Citation: For the outstanding manner in which you perform your duties and for contributing to the increased productivity and data management capabilities of the Document Delivery Services Branch.

March 1991 - Certificate of Merit. Citation: In appreciation for your efforts in support of the National Biological Impact Assessment Program, enabling the National Agricultural Library to fulfill its commitment to provide timely and pertinent information to the Program.

March 1991 - Certificate of Merit. Citation: For significant achievements in applying technology to operations and services of the Public Services Division.

December 1989 - Certificate of Merit. Citation: For your exemplary response to additional duties which included the development of new skills to manage a vastly changing technology.

November 1988 - Certificate of Appreciation. Citation: For her willing assumption of additional duties and support of the Branch Head during a period of staff shortage.

November 1988 - Certificate of Appreciation. Citation: In recognition of your participation in the inauguration of the NAL Official Visitors Program by serving as a Volunteer Tour Guide.

November 1987 - Certificate of Appreciation. Citation: For willing and invaluable service in planning, publicizing, preparing for and successful accomplishment of the second NAL Day in which activities and programs involving information centers and new technology and other library initiatives were presented to the agricultural community.

August 1986 - Certificate of Merit. Citation: For achieving significant improvements to office operating efficiency through the development of automated solutions to problems in the work environment.

December 1985 - Quality Increase Award. Citation: For performance of secretarial duties exceeding job requirements during a period of continuing professional staff growth and work increase.

Judy F. Ruttenberg

5033 Kansas Avenue, N.W.
Washington, D.C. 20011
202-829-2106

EDUCATION

M.L.S. December 1996: Archives
University of Maryland, College Park

M.A. 1994: American History (Cultural and Political)
University of Massachusetts, Amherst — *Distinction*

B.A. 1992: History
University of Michigan — *Distinction*

WORK EXPERIENCE

NATIONAL AGRICULTURAL LIBRARY: October 1995 – Present
(October 1995 - present)

Assistant Librarian, Plant Genome Data & Information Center (PGDIC) – Responsible for coordinating an online digital preservation project and information resource, HTML conversion for PGDIC Homepage, answering reference queries via telephone, postal mail and e-mail, creating bibliographies, maintaining reference statistics, and managing the inventory and distribution of PGDIC publications.

Plant Genome Data & Information Center
National Agricultural Library, 4th Floor
10301 Baltimore Avenue
Beltsville, MD 20705

Current Supervisor: Dr. Susan McCarthy, Coordinator. Phone: 301-504-5510.

MOORLAND-SPINGARN RESEARCH CENTER
HOWARD UNIVERSITY: Summer 1996

Manuscript Intern – Processed the manuscript papers of Rayford W. Logan, including arrangement, description, basic preservation, and the creation of a finding aid.

Moorland-Spingarn Research Center
Howard University
500 Howard Place
Washington, D.C. 20059

Supervisor: Helen Rutt, Senior Manuscript Librarian. Phone: 202-806-7480

NATIONAL MUSEUM OF AMERICAN HISTORY
ARCHIVES CENTER: March – September 1995

Contracted Researcher, Ethnic Imagery Project – Surveyed and photo-documented archival collections in preparation for integration into an image database.

National Museum of American History
Smithsonian Institution
14th Street and Constitution Avenue, NW
Washington, D.C.

Supervisor: Fath Davis Ruffins, Historian and Director of the Center for Advertising History. Phone: 202-357-3270

UNIVERSITY OF MASSACHUSETTS, AMHERST
DEPARTMENT OF HISTORY: January 1993 – May 1994

Writing Instructor, Undergraduate History Program – Instructed upper-class undergraduate history majors in the mechanics of writing research papers.

Teaching Assistant, Introduction to American History – Taught weekly discussion and review sessions, graded papers and exams.

Department of History
University of Massachusetts, Amherst
Amherst, MA 01003

Supervisor: Dr. Mary Wilson, Graduate Program Director. Phone: 413-545-1330

OTHER QUALIFICATIONS

Training: CAB Thesaurus Training (1996); Searching AGRICOLA on Dialog (1996); Basic UNIX (1996); Lotus 1-2-3 (1995); 12th Annual Computers in Libraries conference (1997)

Computer skills: Basic UNIX; Advanced Macintosh and Windows skills: Microsoft Word, WordPerfect, Adobe Photoshop, Celera WordScan, HP Deskscan, FileMaker Pro, Lotus 1-2-3, PageMaker. Internet and HTML proficient, including functional knowledge of site-indexing.

Online search skills: Dialog, Lexis-Nexis.

Language skills: Reading knowledge of Spanish (proficiency exam 1994) and Hebrew.

Michael C. Tims
306 E. Alexandria Ave.
Alexandria, VA 22301
(E-mail) mct@wam.umd.edu

Education:

B.A.	English/Writing	George Mason University	5/83
Ph.D.	Plant Biology	University of Maryland	(current)

Teaching:

University of Maryland

Plant Biology Lab (Core Life Science Course) PBIO100

Plant Taxonomy Lab PBIO 250

Medicinal and Poisonous Plants PBIO 485

Private Seminars (sampling)

The Role of Phytoestrogens in Menopause

Long-Term Immune Enhancements Using Plants

The Use of Plants in Sports Medicine and to Combat Stress

Current Materia Medica and It's Use

Employment:

1990-1996	Private Practice/Herbal Medicine Alex., VA	Clinical Practice
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Maintained a clinical practice that include seeing patients, making herbal medications, and lecturing.

1996-	National Agricultural Library Beltsville, MD	Faculty Research Assistant
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My responsibilities include maintaining a dialog with the Bean Improvement Community to insure that researcher's needs are reflected in the final digitized Journal. I work with Dr. John Kane in tagging the SGML component of the documents and perform fundraising for the continued construction of a digital core of Plant Genome Journals that can be used as databases.

1996-	University of Maryland College Park, MD	Teaching and Research
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My teaching duties at the University of Maryland include botany and taxonomy labs, a medicinal plants course and several lectures to honors courses and "mini-courses" on Medical Botany. My research focuses on mistletoe and it's potential applications as an anti-cancer treatment.

Shilpa Pandharinath Shenvi
9119 Briarchip Street, Laurel, MD 20708
(301) 776 7673

OBJECTIVE A position as an entry level programmer

EDUCATION University of Maryland, Baltimore County
Baltimore, Maryland
Bachelor of Science in Biological Sciences
Graduation Date: May 1996
Grade Point Average: 3.70

**RELEVANT
COURSEWORK** C programming, C++ programming, calculus I,
statistics, physics, neurobiology, animal physiology,
genetics, cell biology, organic chemistry,
plant physiology, developmental biology

**HONORS
AND AWARDS** Presidential Fellowship Award
University of Maryland Honors College

EXPERIENCE Volunteer, Plant Genome Data and Information Center,
National Agricultural Library, MD
10/96 - current
Write PERL scripts which edit text files
Write and edit promotional literature for databases

Teaching Assistant, UMBC, Baltimore, MD
9/94 - 12/94
Explained concepts to students in introductory
biology laboratory and graded papers

Summer Intern, Crops Genetics International
Columbia, MD
6/93 - 9/93; 6/92 - 9/92
Assisted in attempting to induce symbiosis between
nitrogen fixing bacteria and a variety of crop plants
Mastered aseptic microbiological techniques

Summer Intern, UMBC, Baltimore, MD
6/91 - 9/91
Monitored *zwf* and *gnd* gene expression during various
phases of the *Syne chococcus* life cycle

**PROGRAMMING
LANGUAGES** C, PERL, Object Oriented Programming/C++

REFERENCES Available upon request

Daniel Cabirac

45E Ridge Rd. Greenbelt, MD 20770

301-441-1779

dcabirac@nal.usda.gov

<http://www.wam.umd.edu/~cabirac>

mirror: <http://www.glue.umd.edu/~cabirac>

Education

University of Maryland, College Park
Master of Library Science, May 1994

University of New Orleans
Bachelor of Science, Science Education, May 1985

Computer Experience

Unix (Solaris, SunOS, Ultrix): Managed large and busy WWW, Gopher, and FTP sites, and implemented the WAIS search engine and link-checking scripts. Analyzed many search engines including Glimpse, WebGlimpse, SWISH, Harvest, and SiteSearch. Used Perl and Bourne shell scripts to automate many processes. Used X windows, xv, vi, ftp, pico, lynx; netpbm and ImageMagick image processing utilities; UNIX utilities such as sed, grep, crontab, chmod, ln, tar, compress, gunzip.

Programming: Composed basic Bourne shell scripts, and configured and modified Perl scripts.

SGML: Coordinated a large SGML/HTML project involving the conversion of more than 4800 pages of text to SGML, as well as the composition of two complex statements of work, one for SGML text conversion, the other for imaging. Consulted with experts in SGML and digital imaging, and two plant scientists.

DOS/Windows 3.1: Used WordPerfect, Adobe Photoshop, PaintShop Pro, Paradox, Excel, PDF creation tools.

Windows NT: Created user accounts, defragmented hard drives, managed files, made SLIP and PPP connections via the TCP/IP stack, WS_FTP, Netscape, Internet Explorer, Word.

Macintosh: Used Adobe Photoshop, Word, MacWrite, Zterm, Quicktime player, Jpegview, Stuffit Expander, MacDraw, Unix MPEG, Gif Converter, Ofoto.

Work Experience Related to Electronic Publishing

National Agricultural Library

Beltsville, MD (June 1992 - present)

Built and maintained several large and busy WWW sites related to Agricultural and Environmental Sciences for the National Agricultural Library and the University of Maryland:

Biotechnology Information Center WWW site:

<http://www.nal.usda.gov/bic>

Worked closely with a USDA agronomist who is an expert in Agricultural Biotechnology to build and maintain this site. Initiated the automation of WAIS-indexing, link-checking, and HTML mark-up. Oversaw the site's evolution from a few documents on an FTP server in 1993 to a fairly busy gopher site, which has now become a very popular Biotechnology WWW site receiving 10,000 - 35,000 hits per month excluding images. Several hundred sites including many prestigious universities, and U.S. government-funded projects link to this web site.

Plant Genome Data and Information Center WWW site:

<http://www.nal.usda.gov/pgdic>

Worked together with several plant scientists to build this WWW site. This site continues to grow and requires frequent attention. Spearheaded an SGML/HTML project by writing two detailed statements of work, one for SGML mark-up of text, and the other for high-quality imaging. Maintained a Majordomo mailing list. Assisted in copyright searches.

Food and Nutrition Information Center WWW site:

<http://www.nal.usda.gov/fnic>

Responsibility for this WWW site is shared with several others. Oversaw the movement from Gopher to WWW, and assisted in building and maintenance, including WAIS-indexing, link-checking, and construction of databases. Worked together with a programmer to process a CD-ROM of research data so that it could be moved to the WWW.

University of Maryland's Agricultural and Environmental Resources:

<http://www.inform.umd.edu:8080/EdRes/Topic/AgrEnv/>

Assisted UMD faculty and others to build and maintain documents under this portion of the University's Inform WWW site. Processed images and text files for the National Dairy Database so that it could be moved from CD-ROM to the WWW.

Other Duties for National Agricultural Library:

Performed reference services related to Agricultural Biotechnology using DIALOG, WWW global search engines, CD-ROMs, books, and journals. Trained other workers in UNIX, HTML, image processing.

Other Work Experience

Nicholas Orem Middle School, Hyattsville, MD (August 1991 - June 1992)

Taught Physical Science at this Science magnet school using a lab-oriented curriculum.

Supervised 2-4 "wet" labs per week.

Walker Mill Middle School, Capitol Heights, MD (August 1990 - June 1991)

Taught Life Science and Health and organized a field trip for 200 students to spend a day at the National Zoo.

Clifton L. Ganus Secondary School, New Orleans, LA (October 1985 - June 1990)

Taught High School Chemistry, Biology and General Science, Middle School Life Science and Physical Science. Instructed two exchange students from the People's Republic of China in English as a Second Language.

Volunteer Work

Chinese Multimedia Tutorial:

<http://www.inform.umd.edu:8080/EdRes/Topic/Humanities/.C-tut/C-tut.html>

Coordinated this group effort, and performed all technical work.

Alternative Farming Systems Information Center WWW site:

<http://www.inform.umd.edu:8080/EdRes/Topic/AgrEnv/AltFarm/>

Initiated the creation of this WWW site, and provide frequent technical assistance.

Images from the National Agricultural Library's Special Collections:

<http://www.nal.usda.gov/speccoll/>

Initiated the creation of this WWW site, oversaw and assisted in the scanning of most images, and designed the homepage.

Curriculum Vitae

Name: Andrew Kalinski, *Deceased*

Status: U.S. Citizen

Home Address: 2201 Blue Valley Drive
Silver Spring, MD 20904
(301) 384-3265

Education:

- May 1971 M.Sc., Department of Biophysics, University of Warsaw - specializing in biochemical and biophysical methods used in structural studies of nucleic acids.
- Dec. 1976 Ph.D. degree, Department of Biochemistry, University of Warsaw - specializing in the field of chromatin structure. Ph.D. thesis: Structural Organization of the Nucleohistone of a Calf Thymus Gland.

Positions and Professional Experience:

1993 - present

Molecular Biologist - Information Specialist
Plant Genome Data and Information Center
National Agricultural Library, USDA, Beltsville, MD
tel: (301) 504-5579 e-mail: akalinsk@nalusda.gov
Employment: Faculty at the University of Maryland, College Park, MD

I am the principal expert on a database content at the Center. I evaluate and make recommendations for transferring data into NAL database. I also develop new databases available on the Internet (plant genome mapping projects, plant DNA library files and other databases on WWW) and provide expert advise to other database developers.

I provide referral services to a wide range of clientele on both plant and animal topics. I send the requested information by electronic mail or in a traditional way by mail, FAX or telephone. I compiled over twenty publications on molecular biology/genetics subjects for distribution.

I am responsible for training students and scientists in searching databases using electronic mail and Internet. I have already prepared the training program on "Molecular Biology E-mail Servers" and started to teach courses.

I represent the Center at national/international scientific conferences, workshops, poster presentations and seminars demonstrating databases and answering genome related questions.

Additionally to my regular duties at the Center I consult postdoctoral res. associates in the Plant Molecular Biology Lab./USDA in Beltsville on the subject of molecular chaperones in soybean gene expression.

1988 - 1993

Molecular Biologist, GS-12(4)

Plant Molecular Biology Lab., PSI, U.S. Department of Agriculture,
Beltsville, MD

I isolated and characterized cDNA clones encoding oil body membrane proteins (oleosins), thiol proteases and molecular chaperones (BiP). I transferred a soybean thiol protease cDNA into *Nicotiana* plants and studied expression of cysteine proteases in a transgenic tobacco.

I studied developmental, tissue specific and circadian rhythm regulation of the above soybean genes in relation to physicochemical, nitrogen and pathogen (nematodes and insects) stresses.

1986 - 1988

Molecular Biologist, GS-12(2)

Nematology Lab., PSI, U.S. Department of Agriculture,
Beltsville, MD

I studied a restriction fragment length polymorphism of the five major races of soybean cyst nematode *Heterodera glycines*. Multiple copies of repetitive DNA sequences and single copy genes were used as diagnostic characters. I studied genetic resistance of soybean roots to different nematode races in order to identify PR proteins and corresponding plant genes.

1984 - 1986

Postdoctoral Research Associate,

Seed Research Lab., U.S. Department of Agriculture, Beltsville, MD

I studied hormonal regulation of α - amylase gene expression in barley and wheat. I isolated DNA enzymes (nicking, oligonucleosome specific) involved in hormonal regulation of α - amylase gene(s) in aleurone cells.

1982 - 1984

Postdoctoral Research Associate,

Department of Biological Chemistry, University of Maryland, Baltimore, MD

I analyzed a packaging mechanism of DNA in bacteriophage T4 and its temperature sensitive mutants. I compared a sequence of mature, first packed and incompletely packed DNAs.

1980 - 1982

Teaching-Postdoctoral Res. Associate, Department of Biochemistry,
Uniformed Services University of the Health Sciences, Bethesda, MD

I isolated DNA polymerases from *Crithidia fasciculata* and other parasitic protozoa and produced antibodies.

1978 - 1980

Postdoctoral-Cancer Research Scientist, Lab. of Enzymology,
Roswell Park Memorial Institute, Buffalo, NY

I studied chromatin structure of chicken erythrocyte using single-strand specific nucleases. I purified an endogenous nuclease of chicken erythrocyte nuclei specific to single-strand DNA regions in chromatin.

1977 - 1980

Assistant Professor, Department of Biochemistry, Biology Department,
University of Warsaw, Poland

I studied the role of histones in the structure of calf thymus nucleohistone.

1971 - 1977

Research Associate, Department of Biochemistry, Biology Department,
University of Warsaw, Poland

I learned biochemical methods of protein and nucleic acid purification. I isolated DNase-resistant chromatin fragments.

Teaching Experience:

My teaching duties have included all courses in biochemistry for undergraduates and supervision of M.Sc. students.

Societies, Awards and Honors:

Member of Polish Biochemical Society.

Cash award from Polish Academy of Sciences for studies on chromatin structure of calf thymus - 1973

Cash award from Polish Department of Sciences and Education for outstanding Ph.D. thesis - 1977.

Chairman of Enzymology Section at the Annual Meeting of the American Society of Plant Physiologists, St Louis, MO, July 19-23, 1987

The invited "Hot Topic" speaker at the UCLA Symposium on Molecular Strategies for Crop Improvement. April 16-22, 1990, Keystone, Colorado.

Participation in Workshops:

"Gene Sequencing and Cloning in a Single-Stranded DNA of M13 Phage"
Seed Research Lab., USDA, Beltsville, MD - June 1984

"Pulsed Field Gel Electrophoresis and the Technology of Large DNA Molecules"
Waksman Institute of Microbiology, Rutgers University, Piscataway, NJ - October 1987

INFORMATION SYSTEMS DIVISION SUPPORT FOR THE PLANT GENOME RESEARCH PROJECT AT THE NATIONAL AGRICULTURAL LIBRARY

The National Agricultural Library's Information Systems Division (ISD) provides support for the Plant Genome Research Project (PGRP) in four general areas: Systems engineering; Computer programming; End-user support; and Administrative services.

The administrative services and computer programming are directly in support of the needs of the Genome Informatics Group (GIG), systems engineering, while focused on GIG requirements, also provides services on NAL hardware and software that is used by PGRP staff throughout NAL including the Plant Genome Data and Information Center (PGDIC) and Technical Services Division (TSD).

SYSTEMS ENGINEERING

Until FY97 one computer specialist was assigned full-time to support GIG. Now those responsibilities have been spread over three individuals in order to provide more reliable coverage on systems during vacations and illnesses. ISD's Systems Engineering Unit (SEU) provides the following services:

- Systems administration (operating system installation, upgrades of both hardware and software, patch maintenance, daily monitoring, RAID subsystem management, application installation and upgrades) for the UNIX workstations and servers (Sun, Digital Alpha, and SGI) within GIG.
- Systems administration (same as above) on NAL UNIX servers (non-GIG) which provide services utilized by PGRP including GIG.
- WWW-based log system updated with information detailing system administration events.
- Heterogenous network backup support. Includes offsite backup services.
- Technical recommendations regarding new equipment and software purchasing requirements as well as no-cost software.
- Systems maintenance contract administration and non-contract repair requirements for UNIX-based systems and associated peripherals.
- Majordomo mailing list services.
- NAL WWW server (non-GIG).
- Internet News server.

- Primary and secondary Domain Name Services (GIG and NAL).
- Point to point Internet dialup installation and maintenance.
- Gopher server (non-GIG).

COMPUTER PROGRAMMING

ISD has one federal employee who is assigned full time to develop computer programs in support of GIG requests. Because of medical problems the employee was not able to work full time for nearly two years, but is now working very productively at home, with regularly scheduled days in the office for technical meetings with GIG staff.

END-USER SUPPORT UNIT

ISD's End-user Support Unit (ESU) provides the following services:

- Provides end-user support for ADP information and computer systems.
- Analyzes requests for new ADP systems or modifications to existing systems
- Recommends new hardware/software solutions, implementation of new systems on existing hardware platforms, or modifications to existing systems to meet user needs.
- Maintains hardware and software inventories.
- Places purchase orders for all ADP equipment in support of GIG

ADMINISTRATIVE SERVICES

ISD staff provide the following administrative services for the Genome Informatics Group (GIG):

- Telephone answering.
- Preparation of travel documents including making transportation and lodging reservations.
- Preparation of procurement documents for ADP equipment, supplies, furniture, etc.

Table: 4**ISD Budget for Plant Genome Research Project Activities**

	Object Class	1994	1995	1996	1997 Planned
Salaries	1000	\$ 102,445.00	\$ 119,373.00	\$ 127,055.00	\$ 133,457.00
Travel	2100	\$ 17,435.23	\$ 26,201.67	\$ 15,398.46	\$ 30,000.00
Transportation	2200	\$ 101.58	\$ 701.69	\$ 9.36	\$ 0.00
Rent	2300	\$ 328.73	\$ 0.00	\$ 0.00	\$ 0.00
Services/Maint	2500	\$ 56,232.72	\$ 19,630.87	\$ 14,147.45	\$ 18,009.00
Supplies/SW	2600	\$ 148,131.37	\$ 108,504.53	\$ 57,432.33	\$ 57,081.00
Equipment	3100	\$ 190,510.80	\$ 219,506.53	\$ 88,499.08	\$ 200,503.00
Extramural	2550	\$ 193,076.00	\$ 303,506.53	\$ 492,459.80	\$ 388,953.00
Total		\$ 708,261.43	\$ 797,424.82	\$ 795,001.48	\$ 830,000.00

Notes:

Travel funds are primarily used by GIG, but also includes travel for Gary McCone to annual Plant (and Animal) Genome meeting in San Diego.

1995 Travel also includes travel for Gail Juvik in support of the Animal Genome Project and includes foreign travel for Steve Heller at ARS' request.

FY 1994 Expenditures in Excess of \$5,000

\$ 29,000	NAL -- for clerical support
\$ 15,000	National Science Foundation -- in support of a training course entitled Plant Biochemistry Course 1994.
\$ 40,000	Rutgers University -- for plant gene nomenclature assistance
\$ 30,000	Department of Energy, Lawrence Berkeley Laboratory -- for payroll expenses and overhead for software development project for database software
\$ 9,650	Falcon -- Macintosh development system to provide interface for Plant Genome users who have Macintosh systems.
\$ 8,400	Sybase -- telephone and software upgrades and support for Plant Genome. Sybase was main database software.
\$ 6,900	Sun -- for onsite maintenance of one Sparc 10 and 4 Sparc 2s
\$ 22,500	Sun -- to upgrade 4 of its older development systems (Sparc Stations) to current model to enhance performance and increase work productivity
\$ 35,000	GTSI -- for tape library system to backup and archive all sun workstations
\$ 6,600	Total Tec Systems -- for 4 barracuda disk drives to upgrade 4 plant genome development machines with more hard disk drive capacity.
\$ 29,000	SEWP -- for Epoch server, epoch library for exabyte, installation and support
\$ 8,400	New Wave Technologies -- for plasmon recorder and mastering software to produce mastered versions of CD-ROM releases. Allows ability for staff to pretest CD-ROM.
\$ 20,600	Workstation Technologies -- for three SPARCstation 2s . Two systems for new staff members and one for dedicated file server.
\$ 14,800	GTSI -- for RAID disk array and controller
\$ 15,900	AC Technologies -- for five 2.1 GB hard disk drives to provide additional disk capacity for GIG systems to accommodate large volume of data being sent by ARS Cooperators. Also a coprocessor for database server to improve throughput.

\$ 80,600	SEWP -- for two SPARCstation 20s with arrays for plant genome
\$ 8,900	NYMA -- for color laptop computer to be used by Plant Genome staff
\$ 12,400	NYMA -- for pentium workstations

FY 1995 Expenditures in Excess of \$5,000

\$ 29,000	NAL -- for clerical support
\$ 20,000	Rutgers University -- for plant gene nomenclature assistance
\$ 41,388	Government Micro Resources -- for six Sun Microsystems Sparcstations Model 70 to be used to collect, organize, and evaluate GIG data.
\$ 8,600	Sun Microsystems -- for on-site hardware/software maintenance
\$ 19,100	Software Moguls -- for software for server, clients, and controller
\$ 20,400	NYMA -- for three pentiums to be used for development of ACEDB applications for Linux and for monitoring servers.
\$ 47,000	Government Micro Resources -- for one desktop server package, processors, memory expansion, monitors to be used to upgrade and enhance existing servers
\$ 49,200	Silicon Graphics -- for workstation to be used for molecular modeling for DNA and proteins and for development of ACEDB software and CD-ROM.
\$ 42,700	Digital Equipment -- for Alpha Server workstation
\$46,000	Government Micro -- for Sun SPARCstorage array subsystem to be used with existing SPARCstorage array in order to provide increased storage, throughput, and fault-tolerance for GIG server.

FY 1996 Expenditures in Excess of \$5,000

\$ 29,000	NAL -- for clerical support
\$ 44,500	Government Micro Resources -- SPARC storage array to provide system level fault tolerance for existing array subsystem on the main web server for GIG.
\$ 6,800	NYMA -- Laptop computer to develop operations for GIG
\$ 30,200	Digital Equipment Corp -- for memory expansion
\$ 19,800	NYMA -- Pentium systems, modems, SCSI disk drives for support of development efforts of GIG

FY 1997 Expenditures in Excess of \$5,000

\$17,600	Sun -- Service, maintenance on systems
\$ 7,500	Digital Equipment -- for new media CD containing software and documentation
\$11,100	Computerware -- for Tektronix phaser printer

Appendix. CVs from ISD Staff

Current *Curriculum Vitae* and Resumes for all professional staff.

Diana Claburn

EMPLOYMENT

Computer Specialist

1993-1997

USDA, ARS, NATIONAL AGRICULTURAL LIBRARY
10301 BALTIMORE BLVD., ROOM 011
BELTSVILLE, MD 20705

Responsibilities and accomplishments:

Provides end-user support for information and computer systems. Investigates problems, performs studies and works with the end-users operations staff, and hardware/software vendors to propose alternatives and to achieve satisfactory resolutions for problem situations. Evaluates alternatives for cost effectiveness as well as compliance with Agency policies and procedures. Develops proposals and recommends action.

Provides end-user support for ADP information and computer systems operated by organizations external to NAL, but used by NAL staff. Develops appropriate user documentation, as necessary. Develops and maintains contacts with officials responsible for operation of external systems. Reports problems and works to achieve satisfactory resolutions. Serves as NAL expert for systems for which responsible.

Analyzes requests for new ADP systems or modifications to existing systems. Depending on requirements, recommends new hardware/software solutions, implementation of new systems on existing hardware platforms, or modifications to existing systems to meet user needs. Prepares formal, written reports documenting recommendations.

Serves and actively participates on committees that deal with or relate to areas of responsibility. Reports, as required, on assigned projects and systems.

Provides written monthly reports on the status of all projects and activities for which responsible.

EDUCATION

Computer Sciences AA (Information Systems Option)
PRINCE GEORGES COMMUNITY COLLEGE

(1992-present)
LARGO, MD

ADDITIONAL EDUCATION

Management Problems of the Technical person in a Leadership Role
attended December 9, 1996

Windows 95 Advanced: an in-depth look at the performance and migration issues of the New Windows
attended July 29-30, 1996

Installing and Managing Microsoft NT Server in your network enterprise
attended October 10-11, 1995

Installing, Supporting, and Troubleshooting Windows 95
attended September 27-28, 1995

How to Become a Better Communicator
attended August 23, 1995

Managing Multiple Projects, Objectives and Deadlines: how to get organized and stay that way
attended July 14, 1995

The Essentials of Excellent Customer Service: how to handle angry customers with diplomacy and tact
attended June 26, 1995

Troubleshooting and Fine-Tuning the Network PC
attended October 3-4, 1994

Advanced Troubleshooting: diagnosing, repairing and upgrading IBM and compatible PCs
attended September 29-30, 1994

The Help Desk Analyst's Workshop
attended April 11-12, 1994

Building and Supporting your Local Area Network
attended April 5-6, 1994

Supporting and Troubleshooting Windows 3.1
attended February 7-8, 1994

Troubleshooting and Maintaining PCs
attended February 1-2, 1994

4. Brief descriptions of the project-related responsibilities assigned to all individuals paid from this budget, as well as the percent time devoted to Plant Genome activities.

Responsible for providing end-user support for ADP information and computer systems operated by organizations external to NAL, but used by NAL staff. Analyzes requests for new ADP systems or modifications to existing systems. Depending on requirements, recommends new hardware/software solutions, implementation of new systems on existing hardware platforms, or modifications to existing systems to meet user needs. Maintains the hardware and software inventories.

Time devoted to the Plant Genome activities is approximately 5% of my time.

Curriculum Vitae

Marty S. Sikes

Personal

WORK:

National Agricultural Library
10301 Baltimore Blvd. Room 013
Beltsville, MD 20705

HOME:

7306 Eden Brook Dr. #228
Columbia, MD 21046

Education

Howard Community College - Columbia, MD
Course in Pascal Programming

Catonsville Community College - Catonsville, MD
Course in Fortran Programming

1981 Control Data Institute - Arlington, VA
Major: Computer Technology
Honors Graduate - Final Course Grade 98.9%

Sun Microsystems Inc, training courses:

Sun Network Security, Solaris 2.x Concepts and Tuning, Perl
Programming, Sun Solaris 1.x to 2.x System Administration , Sun
Advanced System Administration.

Silicon Graphics Inc, training courses:

Silicon Graphics System Administration,

Numerous other manufacturer computer hardware related training courses
provided upon request.

Professional Experience Applicable in Computer Science Field

1994 - present National Agricultural Library
Systems Administrator - Library Webmaster

1992 - 1994 AC Technology
Manager Engineering Services

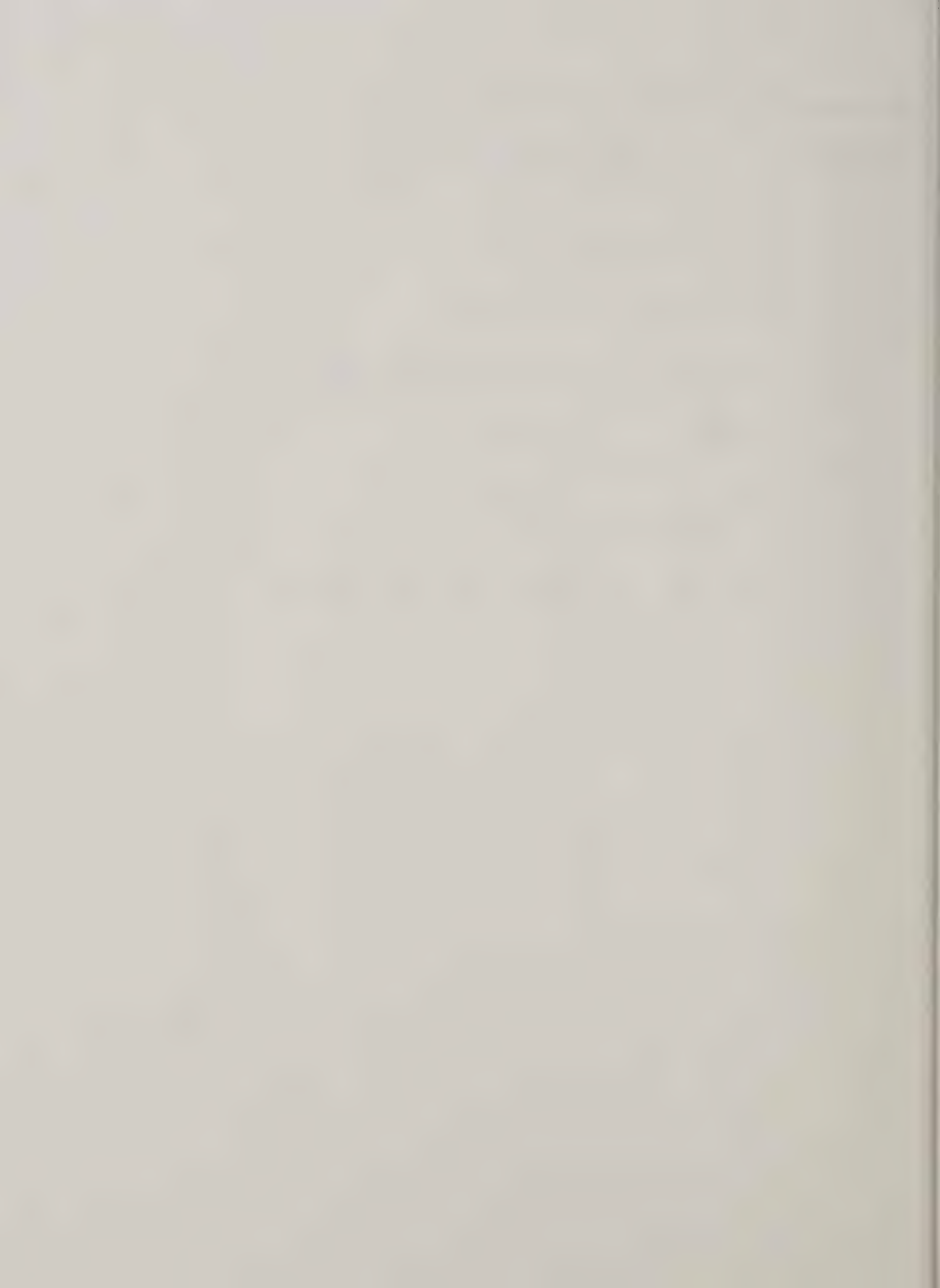
1990 - 1992 Design Data Systems
Senior Field Service Engineer

1985 - 1990 Computer Engineering Associates
Senior Field Service Engineer - Engineer In Charge

1984 - 1985 Data General
Field Service Engineer

1983 - 1984 GenRad Corporation
Field Service Engineer

1981 - 1983 Computer Systems Support Corporation
Computer Technician



Plant Genome Databases Program Review

Technical Services Division

Through funding received from U.S.D.A. Agricultural Research Service for enriching NAL's collection and enhancing the scope of AGRICOLA in the areas pertinent to the Plant Genome Research Program, the NAL Technical Services Division performs a variety of tasks. These include the selection, acquisition, and processing of new print and electronic literature, the enrichment of the AGRICOLA database through abstracts, additional citations to the literature, access to sequencing data, and analysis of genetics terminology in the CAB Thesaurus.

The preparation of bibliographic citations to the plant genome literature selected for inclusion in the AGRICOLA database includes the addition of information to facilitate access to literature containing actual sequence data by both human users and computer applications. Specifically, both cataloging and indexing records created after October 1990 contain the following information when appropriate:

1. The descriptor "molecular sequence data" is added to the record for any book, article or item that contains nucleotide or amino acid sequences in the text. An additional descriptor is added to indicate either "nucleotide sequence" or "amino acid sequence". These descriptors are compatible with terms by the National Library of Medicine and BIOSIS for indexing biotechnology literature that contains sequence data.
2. If the item being described references a databank where the sequence data have been deposited, an identifier in the form of a code is added to the citation, e.g., GENBANK.

Acquisition of the Literature

TSD acquires printed books, serials, proceedings, and electronic resources identified as primary literature with significant plant genome information and sequence data. Additional subscriptions to more general journal titles such as Science and Nature, that contain important information on developments in biotechnology are purchased to expedite indexing and facilitate document delivery. Over 130 subscriptions are maintained to ensure that the NAL collection supports the requirements to extract, summarize and distribute genome resource data.

Indexing

As part of the ARS Plant Genome Research Program, the Indexing Branch provides access to the published literature on plant genome research. Forty-one journals are indexed and abstracted (list enclosed) at the request of the Plant Genome and Data Information Center of NAL. However, published articles on the subject are scattered throughout the journal literature indexed for AGRICOLA and their inclusion further benefits the Program. A list of Plant Science titles indexed and some sample indexing records are enclosed.

The Indexing Branch engages in the following indexing and indexing-related activities in support of the Program: journal check-in and distribution, article selection, subject analysis and access, controlled vocabulary enhancements (see enclosure), descriptive indexing, scanning abstracts, and data entry. As the attached budget reports indicate, most of the funding was used to pay indexers as off-set for the functions provided by existing staff. A modicum (\$16,265) was used for supplies and equipment purchases and maintenance in direct support of indexing activities during FY94 and FY95. Program funds paid for the attendance of the Indexing Branch PG Coordinator at PG Conferences in San Diego during 1994, 1995, and 1996. In addition to helping with the PGDIC exhibit at the conferences, the Indexing Coordinator serves as a liaison between PGDIC and the Indexing Branch for indexing processing activities.

Table 5.
EXPENDITURES IN SUPPORT OF
PLANT GENOME RESEARCH PROJECT
TSD

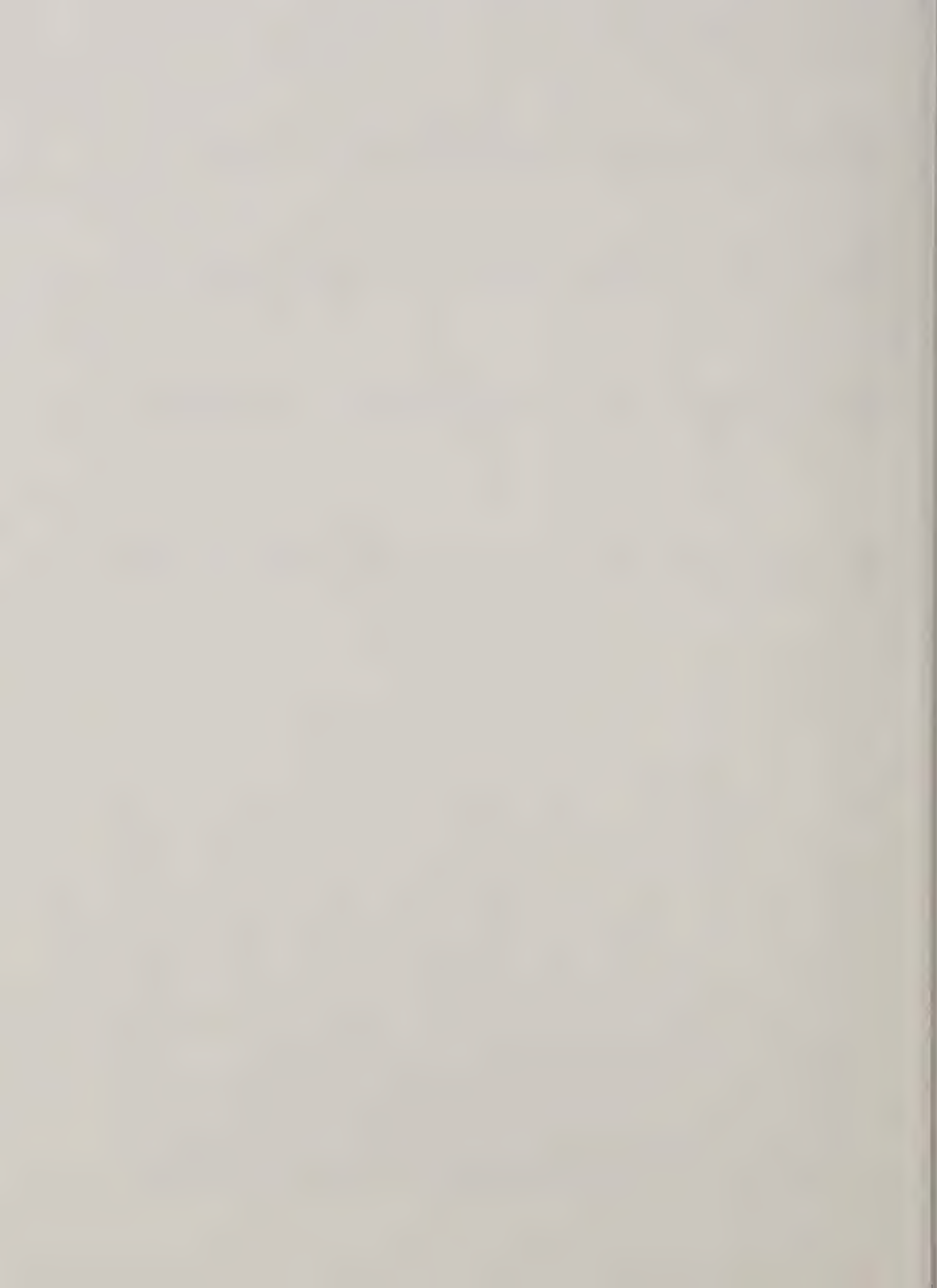
		FY 1994	FY 1995	FY 1996	FY 1997
Salaries, Federal	1000	98,726	69,117	67,500	61,500
Extramural	2550	37,200	64,987	65,674	80,000
Travel	2100	1,033	1,462	1,066	0
Other Services (repair & maintenance	2500	250	250	250	250
Supplies & Materials	2600	600	1,060	600	400
Equipment	3100	6,815	7,938	0	0
Library Materials	3100	87,000	94,000	110,600	104,000
Expended		231,624	238,814	245,690	246,150

Appendix 1. Plant Genome Serials Purchased

PLANT GENOME SERIALS PURCHASED FY94-FY97

	COST		
	FY94	FY95	FY96
AGRICOLA database [CD-ROM]	412	413	413
AGRICOLA database [CD-ROM]	412	413	413
AGRICOLA database [CD-ROM]	412	413	413
Abstracts in biocommerce: ABC	796	836	878
Advances in DNA sequencing specific agents	0	0	93
Advances in cellular and molecular biology of plants	0	203	0
Advances in genetics	59	59	123
Agrisearch formerly CRIS/ICAR [CD-ROM]	596	596	596
Agrofood industry hi-tech	155	164	175
Agrow world crop protection news	498	546	570
Annales de genetique	265	315	367
Annual review of biophysics and biomolecular structure	62	62	66
Annual review of genetics	44	47	47
Annual review of plant physiology and plant molecular biology	47	47	51
Applied genetic news	350	375	375
BA/RRM on CD [cdrom]	0	2830	2830
BIOSIS previews search guide	0	115	0
BioEssays	295	310	350
Biochemical genetics	625	655	655
Biochemistry (Easton)	1345	1517	1764
Biochimica et biophysica acta	7322	7555	8837
Biological abstracts on CD	4800	5130	5510
Biopharm	59	59	64
Biopolymers	1695	2196	2646
Bioscan on disc [CD-ROM]	1200	1140	925
Biotechnology abstracts [CD-ROM]	2450	2450	2450
Biotechnology advances	395	425	495
Biotechnology citation index [CD-ROM]	1950	1969	2010
			FY97
			0
			0
			0
			878
			0
			334
			83
			0
			175
			604
			352
			0
			58
			0
			395
			0
			0
			395
			675
			1870
			10528
			0
			64
			3620
			1075
			2450
			569
			2070

	COST			
	FY94	FY95	FY96	FY97
Biotechnology software and internet journal	109	119	0	146
Bulletin of mathematical biology	650	650	700	770
Canadian journal of plant science. Revue canadienne de phytotechnie	87	86	85	87
Cell and chromosome research	20	20	20	30
Chinese journal of genetics = Acta genetica Sinica	0	450	495	540
Cold Spring Harbor symposia on quantitative biology: proceedings	272	286	292	0
Communicating science news	7	0	0	0
Computer and information systems abstracts journal	1265	1265	1285	0
Computer applications in the biosciences	0	0	320	350
Computers in biology and medicine	560	604	722	812
Congressional yellow book	225	450	250	250
Conservation biology : the journal of the Society for Conservation Biology	175	175	250	275
Cucurbit Genetics Cooperative membership	24	0	24	0
Current advances in cell & developmental biology	885	885	1093	1252
Current advances in genetics & molecular biology	1015	1015	1269	1436
Current advances in plant science	1065	1155	1357	1533
Current advances in protein biochemistry	760	760	920	1018
Current genetics	915	1049	1329	1419
Cytology and genetics	835	895	975	1060
DNA and cell biology	400	436	508	585
DNA sequence: the journal of DNA sequencing and mapping	0	0	689	0
Database technology	0	0	0	0
Developmental genetics	360	576	664	796
Developments in plant pathology	293	75	440	0
Diversity	35	35	35	35
EMBO journal	695	750	825	925
Entrez	0	76	0	0
Environmental and molecular mutagenesis	295	350	390	424
Euphytica; Netherlands journal of plant breeding	816	1026	1364	0

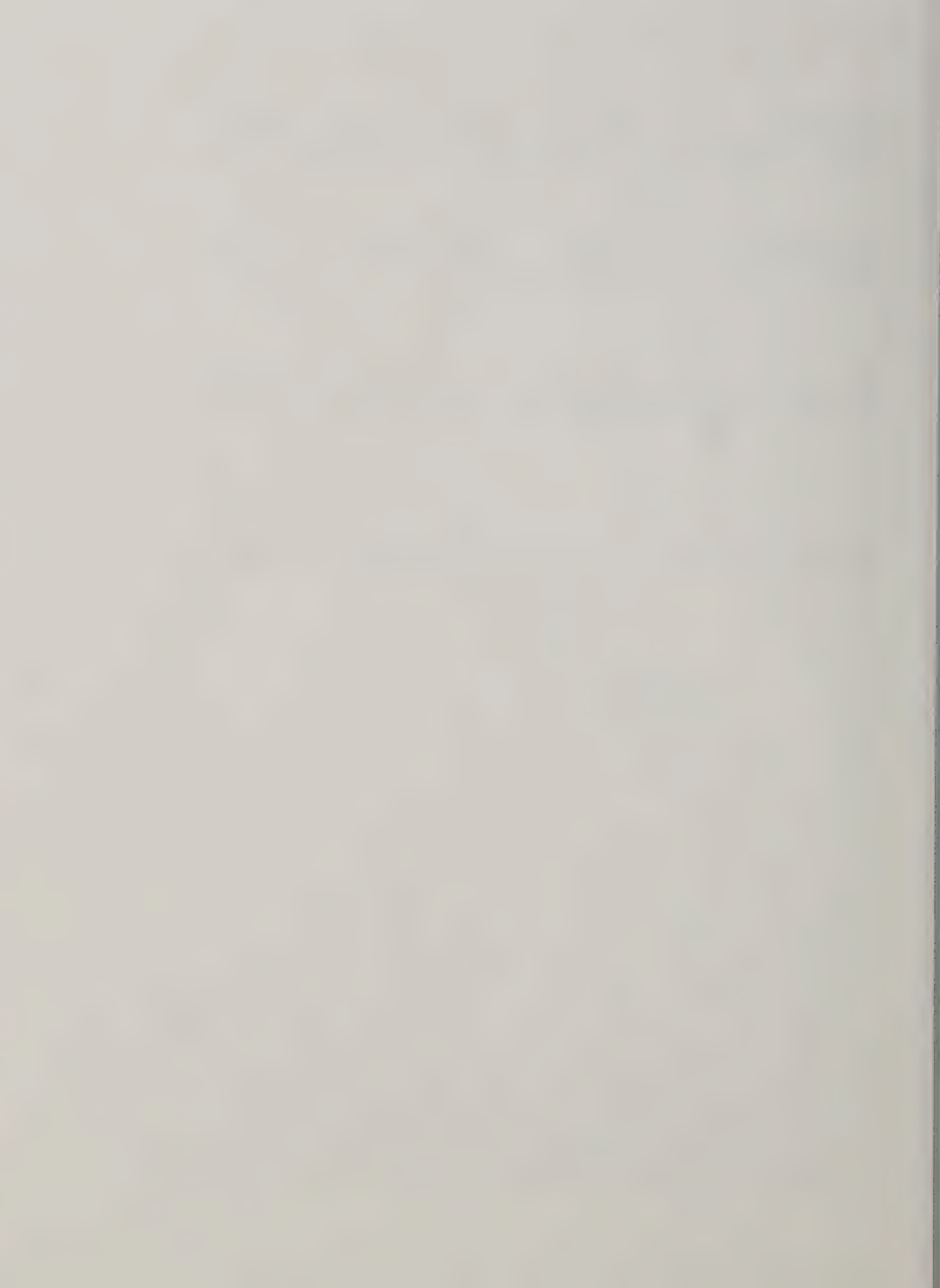


COST

	FY94	FY95	FY96	FY97
GEN guide to biotechnology companies [computer file]	113	0	191	0
Gene	3584	3924	5069	6144
Genes & development	450	450	533	587
Genetic analysis, biomolecular engineering	188	188	244	278
Genetic engineering news : GEN	200	200	228	243
Genetic resources and crop evolution	159	227	405	485
Genetic technology news	585	585	650	650
Genetica	430	511	795	1231
Genetical research	279	296	325	342
Genetics (Austin)	270	330	495	0
Genewatch : a bulletin of the Committee for Responsible Genetics	33	30	30	50
Genome	239	262	300	315
Genome research	340	208	495	50
Genomics	600	698	900	1100
Human genome abstracts	215	215	350	325
Journal of biochemistry (Tokyo)	314	341	346	231
Journal of biological chemistry	790	837	1150	1400
Journal of biomolecular structure & dynamics	645	645	760	845
Journal of cell biology	440	480	525	625
Journal of chemical information and computer sciences	202	230	276	298
Journal of computer-aided molecular design	658	807	996	990
Journal of evolutionary biochemistry and physiology	1095	1165	1275	1375
Journal of genetics & breeding	225	124	131	0
Journal of heredity	112	120	140	155
Journal of mathematical biology	657	719	909	928
Journal of molecular biology	1978	2945	3065	3511
Journal of molecular evolution	0	0	0	999
Journal of molecular graphics	360	360	525	602
Journal of theoretical biology	1487	1895	2117	2359

	COST		
	FY94	FY95	FY96
Life science advances molecular genetics	0	0	150
Life science advances plant physiology	0	0	300
Maize genetics cooperation news letter	20	20	20
Maize genetics cooperation news letter	20	20	0
Mammalian genome: official journal of the International Mammalian Genome Society	269	269	361
Mathematical biosciences	976	1112	1558
Methods in enzymology	1335	747	1277
Methods in gene technology	0	101	0
Methods in molecular and cellular biology	0	150	240
Methods in plant biochemistry	99	0	0
Molecular & general genetics: MG	2242	2557	3232
Molecular biology (New York)	1325	1395	1495
Molecular breeding	0	0	239
Molecular ecology	335	460	535
Molecular microbiology	1090	1226	1490
Molecular reproduction and development	1155	1392	1644
Nature (London)	395	425	495
Nature genetics	495	495	495
Nucleic acids research	1175	1225	1325
Plant and cell physiology	351	387	393
Plant and microbial biotechnology research series	89	181	71
Plant biotechnology	174	179	177
Plant breeding reviews	108	104	108
Plant cell reports	584	624	928
Plant gene research	0	0	0
Plant journal: for cell and molecular biology	721	781	942
Plant molecular biology	1277	1413	1685
Plant molecular biology manual	101	157	206
			0
			1791
			0

	COST		
	FY94	FY95	FY96
Plant molecular biology reporter	170	188	196
Plant physiology (Lancaster, Pa.)	975	1075	1225
Planta	1889	2039	2680
Plantations recherche developpement	0	233	218
Plasmid	208	239	295
Proceedings of the National Academy of Sciences of the United States of America	460	530	615
Protein science	605	605	775
Rice genetics newsletter	0	0	0
Russian journal of genetics	1175	1270	1495
Science	215	228	260
Sciencewatch	345	345	0
Scientist	58	58	58
Scitech book news	65	65	0
Seedhead news	36	0	40
Soviet journal of bioorganic chemistry	0	965	1150
Soybean genetics newsletter	15	30	30
Systematic and applied microbiology	420	448	517
TAG: Theoretical and applied genetics	1918	3213	3177
Trends in cell biology	490	514	687
Trends in genetics	490	514	687
Trends in plant science	0	0	687
Virus genes	0	0	458
136 Titles	78525	90799	10065
+ 4% Service Charge	3141	3632	4003
Total	81666	94431	104068



Appendix 2. Journals Indexed for Plant Genome Research Program

Journals Indexed for Plant Genome Research Program

Annual Report of the Bean Improvement Cooperative
Biochemistry
Biochimica et Biophysica Acta = International Journal of Biochemistry and Biophysics
Biopolymers
Bulletin of Mathematical Biology
Cold Spring Harbor Symposia on Quantitative Biology
Computer Applications in the Biosciences
Conservation Biology
Current Genetics
Developmental Genetics
The EMBO Journal
Gene
Genetic Analysis, Biomolecular Engineering
Genome
Genomics
Journal of Biochemistry
Journal of Biological Chemistry
Journal of Biomolecular Structure and Dynamics
Journal of Cell Biology
Journal of Chemical Information and Computer Sciences
Journal of Molecular Biology
Journal of Molecular Evolution
Journal of Molecular Graphics
Journal of Quantitative Trait Loci
Journal of Theoretical Biology
Mathematical Biosciences
Methods in Enzymology
Molecular and Biochemical Parasitology
Molecular and General Genetics
Molecular Microbiology
Nature
Nucleic Acids Research
Plant and Cell Physiology
The Plant Cell
Plant Molecular Biology
Plant Physiology
Plasmid
Proceedings of the National Academy of Sciences of the United States of America
Science
Systematic and Applied Microbiology
Trends in Plant Science

Appendix 3. Vocabulary Enhancements for Plant Genome

Vocabulary Enhancements for Plant Genome for FY94 through FY97 (3/31/97)

FY94

Proposals for the improvement of genetics terminology in *CAB Thesaurus* were sent to CAB International in December 1994. Proposals include 58 new descriptors, 53 non-descriptors, 4 new scope notes for existing terms, 5 deletions of descriptors, and 12 changes of descriptors to non-descriptors (Appendix A). Ninety percent (90%) of proposals were accepted. Changes to the genetics terminology were implemented with the publication of the 1995 edition of *CAB Thesaurus*.

FY95

Vocabulary maintenance included no special efforts for Plant Genome Research Program.

FY96

Vocabulary maintenance included no special efforts for Plant Genome Research Program.

FY97

Electronic version of CAB Thesaurus was implemented in-house for AGRICOLA indexers in September. Genetics terminology that was enhanced in the December and March updates to the thesaurus file include: 49 definitions, 2 new non-descriptors, and 2 changes to word blocks (Appendix B).

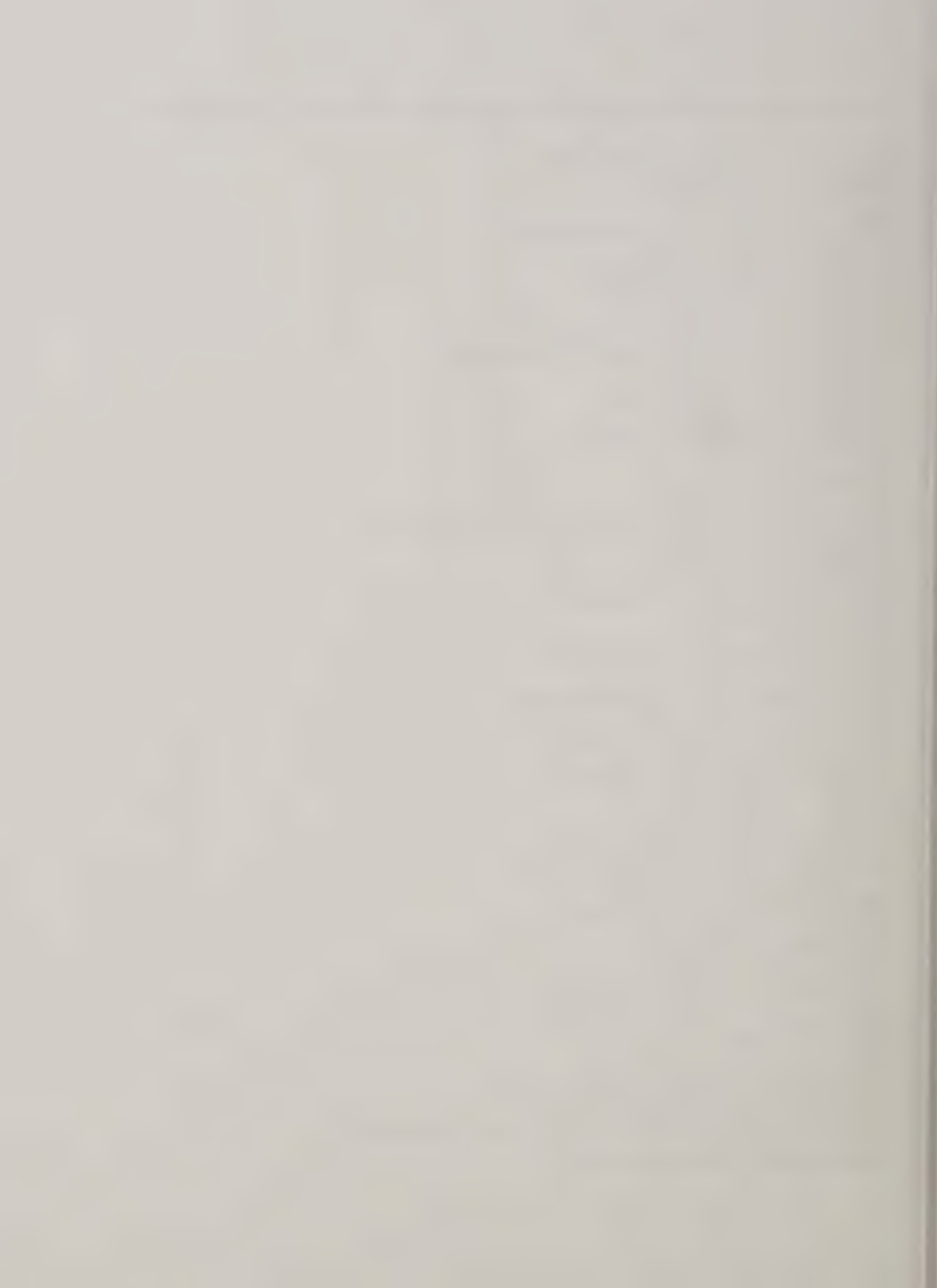
Future

Enhancements to terminology, (i.e., the addition of definitions, scope notes and non-descriptors), are expected to continue with the periodic updates to the main thesaurus file. Expanding the availability of the electronic thesaurus to all NAL staff, including Plant Genome Data and Information Center, is anticipated.

FY94 proposals for the improvement of genetics terminology in *CAB Thesaurus*.

Proposed new descriptors and their BT:

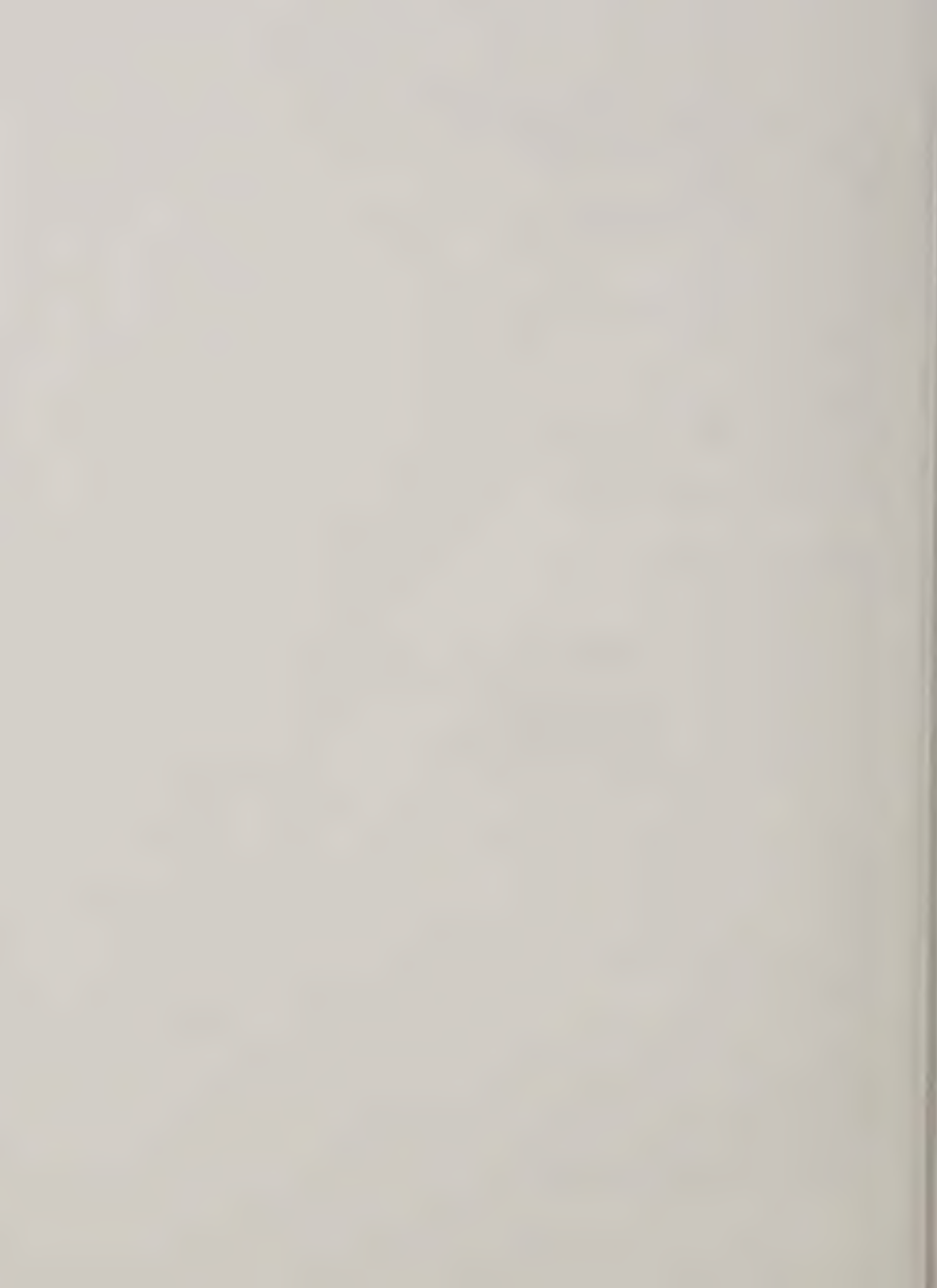
allopolyploidy [BT polyploidy]
anaphase [BT cell division]
animal genetic resources [BT genetic resources]
autopolyploidy [BT polyploidy]
c banding [BT chromosome banding]
chloroplast dna [BT dna]
chromosome segregation [BT cell division]
chromosome inversions [BT chromosome aberrations]
codominance [BT dominance]
codons [BT nucleotide sequences]
complete dominance [BT dominance]
dna binding motifs [BT amino acid sequences]
dominant genes [BT genes]
enhancer sequences [BT regulatory sequences]
gene tagging [BT biological techniques; BT tracer techniques]
genetic diversity [BT genetic variation]
genetic stability [BT genetic parameters]
genomic imprinting [BT not proposed]
genotoxicity [BT toxicity]
germplasm exchange [BT not proposed]
hexaploidy [BT polyploidy]
histocompatibility genes [BT structural genes]
homeobox genes [BT regulatory genes]
homeoboxes [BT regulatory sequences]
incomplete dominance [BT dominance]
intergenic dna [BT dna]
interphase [BT cell division]
leucine zipper [BT dna binding motifs]
metacentric chromosomes [BT chromosomes]
microsatellites [BT satellite dna]
minichromosomes [BT chromosomes]
nuclear genes [BT genes]
nullisomy [BT aneuploidy]
open reading frames [BT nucleotide sequences]
operator region [BT regulatory sequences]
operons [BT genes]
organelle mutations [BT mutations]
phenotypic variation [BT genetic parameters]
promoter region [BT regulatory sequences]
random amplified polymorphic dna [BT dna; BT genetic markers]
recessiveness [BT molecular genetics]



reciprocal translocation [BT chromosome translocation]
regulatory sequences [BT nucleotide sequences]
replication origin [BT nucleotide sequences]
restorer genes [BT genes]
reverse transcription [BT transcription]
signal peptide [BT amino acid sequences]
start codon [BT codons]
stop codon [BT codons]
tata box [BT regulatory sequences]
telophase [BT cell division]
tetrasomy [BT aneuploidy]
transposition [BT mutations]
unique sequences [BT dna]
w chromosome [BT sex chromosomes]
yeast artificial chromosomes [BT chromosomes]
z chromosome [BT sex chromosomes]
zinc finger motif [BT dna binding motifs]

Proposed non-descriptors:

alloploidy USE allopolyploidy
amber codon USE stop codon
autoploidy USE autopolyploidy
chloroplast mutations USE organelle mutations
chromosomal inversion polymorphism USE inversion polymorphism
chromosome disjunction USE chromosome segregation
chromosome imprinting USE genomic imprinting
chromosome separation USE chromosome segregation
cis-acting elements USE regulatory sequences
cis-acting sequences USE regulatory sequences
coding triplet USE codons
cytoplasmic mutations USE organelle mutations
disjunction USE chromosome segregation
dna transcription USE transcription
enhancer regions USE enhancer sequences
extranuclear mutations USE organelle mutations
fertility restoring genes USE restorer genes
g1 phase USE interphase
g2 phase USE interphase
gene transposition USE transposition
genetic imprinting USE genomic imprinting
genetic inheritance USE inheritance
genetic segregation USE segregation
genetic variability USE genetic variation
genotypic variability USE genetic variation
genotypic variation USE genetic variation



g0 phase USE interphase
imprinting (genetic) USE genomic imprinting
initiation codon USE start codon
intergenic spacers USE intergenic dna
mrna USE messenger rna
mitochondrial mutations USE organelle mutations
ochre codon USE stop codon
operator sequences USE operator region
operators (genetic) USE operator region
orfs USE open reading frames
ori site USE replication origin
origin of replication USE replication origin
phenotypic variability USE phenotypic variation
plastid mutations USE organelle mutations
promoter sequences USE promoter region
promoters (genetic) USE promoter region
quantitative inheritance USE polygenic inheritance
recessivity USE recessiveness
reverse mutations USE back mutations
rflp USE restriction fragment length polymorphism
rna translation USE translation
s phase USE interphase
signal sequence USE signal peptide
somatic variation USE clonal variation
spacer dna USE intergenic dna
stability (genetic) USE genetic stability
unique dna USE unique sequences

Proposed Scope Notes for existing descriptors:

interference
genetic polymorphism
genetic variance
genetic variation

Proposed deletions:

destabilizing selection
dna slippage
genetic economics
genetic factors
plasmagenes

Proposals to change existing descriptors to non-descriptors:

b chromosomes
biochemical genetics

c bands
controlling elements
genetic defects
genetic differences
infinite alleles model
inversion
minisatellites
restriction endonuclease analysis
semidominance
subvital factors

Genetic terminology enhancements made in FY97 to the electronic thesaurus

New Non-Descriptors:

allelic frequency USE gene frequency
diversity, genetic USE genetic diversity

Changed word blocks:

genetic drift
genetic resistance

Definition added:

acquired characteristics	
alleles	homozygosity
alloenzymes	isoenzymes
allopolyploidy	mixoploidy
allotypes	monosomy
aneuploidy	nullisomy
autopolyploidy	penetrance
chimeras	phenotypic variation
chimerism	pleiotropy
chromosome translocation	polyploidy
chromosome segregation	reciprocal translocation
coefficient of relationship	segregation distortion
cosmids	somaclonal variation
dna methylation	tetraploidy
dna repair	tetrasomy
dosage compensation	transduction
epistasis	translocation
euploidy	transposable elements
founder effect	triploidy
gene frequency	trisomy
gene dosage	
genetic correlation	
genetic markers	
genetic drift	
genetic equilibrium	
heritability	
heteroploidy	
heterosis	
heterozygosity	
hexaploidy	

Appendix 4. CVs from TSD Staff

Current *Curriculum Vitae* and Resumes for all professional staff.

C.V. -- L. Deana Parks
Indexer

Education

B.S. (1966), Chemistry -- Tennessee Wesleyan College

PhD (1973), Biochemistry -- Florida State University

MLS (1990), Library and Information Science -- University of Maryland

Recent Continuing Education

WordPerfect for Windows 6.1; Seven Habits of Highly Effective People

Indexing Experience

National Agricultural Library, 1988--

C.V. -- Raymond Fisher
Indexer

Education

B.S. (1975), Biology -- New Mexico State University
M.S. (1978), Biology -- New Mexico State University

Recent Continuing Education

Mosaic; WordPerfect for Windows 6.1; Netscape 2.0

Indexing Experience

National Agricultural Library, 1990--
Cambridge Scientific Abstracts, 1982-1990

**C.V. -- Deborah Friedman
Cataloger**

Education

B.A. (1979), Russian -- Kutztown State College
MLS (1980), Special Library Courses, Literature of Science and Technology
Indiana University

Experience

Special materials cataloger, National Agricultural Library, 1990-
Primary cataloger in support of plant genome review
Performs original cataloging of videocassettes, soundrecordings, maps ,kits, etc. as well as
monographs using AACR2 and LC classification

Membership

American Library Association



1023032827

C. V. - Technical Information
- Catalogue

Editorial

M.A. (1979), Kuchan - Kuchan
M.S. (1980), Special Library, Kuchan - Kuchan
Kuchan University

Expenditure

Special library catalogue, Kuchan - Kuchan, 1980
Library catalogue in support of the library
Kuchan - Kuchan, 1980
Kuchan - Kuchan, 1980
Kuchan - Kuchan, 1980

Membership

Annual Library Association